# MARKET OPPORTUNITIES FOR DATA BASE SERVICES

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# MARKET OPPORTUNITIES
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## TABLE OF CONTENTS


| | | Page |
|---|---|---|
| I | INTRODUCTION AND SCOPE | 1 |
| | A. Introduction | 1 |
| | B. Scope | 2 |
| II | EXECUTIVE SUMMARY | 5 |
| | A. Market Forecast | 5 |
| | B. Future Trends | 13 |
| | C. Recommendations | 15 |
| | 1. Management | 15 |
| | 2. Marketing | 15 |
| | 3. Product | 17 |
| III | MARKET ANALYSIS AND FORECAST | 21 |
| | A. Market Structure | 22 |
| | 1. Market Participants | 22 |
| | a. Data Base Vendors | 22 |
| | b. RCS Vendors | 24 |
| | c. Distribution Vendors | 24 |
| | d. Intermediaries | 24 |
| | e. End Users | 25 |
| | 2. Supporting Technologies | 25 |
| | 3. Market Definition | 29 |
| | B. Market Forecast | 32 |
| | 1. Methodology | 32 |
| | 2. Forecast Of User Expenditures | 33 |
| | C. Influencing Factors | 37 |
| | 1. Technology | 37 |
| | 2. Competition | 40 |
| IV | MARKET ANALYSIS BY DATA BASE SUBSECTOR | 47 |
| | A. Econometric | 47 |
| | 1. Types | 47 |
| | 2. Market Forecast | 49 |
| | 3. Key Data Bases | 52 |
| | 4. Key Vendor Services | 53 |
| | B. Securities And Commodities | 55 |
| | 1. Types | 55 |
| | 2. Market Forecast | 57 |
| | 3. Key Data Bases | 57 |
| | 4. Key Vendor Services | 61 |




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| | | Page |
|---|---|---|
| C. | Financial And Economic | 62 |
| | 1. Types | 62 |
| | 2. Market Forecast | 63 |
| | 3. Key Data Bases | 65 |
| | 4. Key Vendor Services | 70 |
| D. | Demographic | 75 |
| | 1. Types | 75 |
| | 2. Market Forecast | 75 |
| | 3. Key Data Bases | 77 |
| | 4. Key Vendor Services | 79 |
| E. | Resources | 80 |
| | 1. Types | 80 |
| | 2. Market Forecast | 80 |
| | 3. Key Data Bases | 81 |
| | 4. Key Vendor Services | 85 |
| F. | Industry | 86 |
| | 1. Types | 86 |
| | 2. Market Forecast | 87 |
| | 3. Key Data Bases | 87 |
| | 4. Key Vendor Services | 95 |
| G. | Legal/Accounting | 96 |
| | 1. Types | 96 |
| | 2. Market Forecast | 97 |
| | 3. Key Data Bases | 97 |
| | 4. Key Vendor Services | 101 |
| H. | News | 103 |
| | 1. Types | 103 |
| | 2. Market Forecast | 103 |
| | 3. Key Data Bases | 105 |
| | 4. Key Vendor Services | 107 |
| I. | Marketing | 109 |
| | 1. Types | 109 |
| | 2. Market Forecast | 110 |
| | 3. Key Data Bases | 112 |
| | 4. Key Vendor Services | 114 |
| J. | Credit | 115 |
| | 1. Types | 115 |
| | 2. Market Forecast | 116 |
| | 3. Key Data Bases | 118 |
| | 4. Key Vendor Services | 120 |
| K. | Bibliographic | 121 |
| | 1. Types | 121 |
| | 2. Market Forecast | 122 |
| | 3. Key Data Bases | 124 |
| | 4. Key Vendor Services | 128 |
| L. | Properties | 128 |
| | 1. Types | 128 |
| | 2. Market Forecast | 129 |
| | 3. Key Data Bases | 132 |
| | 4. Key Vendor Services | 134 |



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| | | Page |
|---|---|---|
| M. | Real Estate | 135 |
| | 1. Types | 135 |
| | 2. Market Forecast | 135 |
| | 3. Key Data Bases | 138 |
| | 4. Key Vendor Services | 139 |
| N. | International | 140 |
| | 1. Types | 140 |
| | 2. Market Forecast | 140 |
| | 3. Key Data Bases | 142 |
| | 4. Key Vendor Services | 146 |
| O. | Other | 148 |
| | 1. Types | 148 |
| | 2. Market Forecast | 149 |
| | 3. Key Data Bases | 149 |
| | 4. Key Vendor Services | 153 |
| V | PRODUCT AND MARKETING ISSUES | 155 |
| A. | Product Strategies | 155 |
| | 1. Data Base Sources | 155 |
| | 2. Data Base Pricing | 157 |
| | 3. Special Technical Requirements | 161 |
| | a. Software | 161 |
| | b. Terminals | 163 |
| | c. Minicomputers | 163 |
| | d. System Response | 164 |
| | e. Data Base Characteristics | 165 |
| B. | Marketing Issues | 166 |
| | 1. Personnel | 166 |
| | 2. Training | 167 |
| | 3. Seminars | 167 |
| | 4. Market Positioning | 167 |
| | 5. Market Integration | 168 |
| C. | Future Opportunities | 169 |
| | 1. Corporate Information Services | 169 |
| | 2. Consumer Information Services | 170 |
| VI | COMPETITIVE ENVIRONMENT | 171 |
| A. | Competitive Structure | 171 |
| B. | Market Share | 172 |
| C. | Typical Vendors And Products | 176 |
| | 1. Data Resources, Inc. | 176 |
| | 2. Interactive Data Corporation | 177 |
| | 3. Automatic Data Processing | 178 |
| | 4. National CSS, Inc. | 179 |
| | 5. Computer Sciences Corporation | 180 |
| | 6. GEISCO | 180 |
| | 7. Service Bureau Company | 181 |
| | 8. Rapidata | 181 |
| | 9. Quotron Systems | 182 |
| | 10. Mead Data Central | 183 |



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| | | Page |
|---|---|---|
| 11. | Dow Jones, Inc. | 184 |
| 12. | Interactive Market Systems | 184 |
| 13. | Telmar Media Systems | 185 |
| 14. | TRW Information Services | 186 |
| 15. | A.C. Nielsen, Inc. | 187 |
| APPENDIX A: | DATA BASE ..... | 189 |
| APPENDIX B: | DEFINITIONS ..... | 193 |
| APPENDIX C: | RELATED INPUT REPORTS ..... | 201 |
| APPENDIX D: | MARKET OPPORTUNITIES FOR DATA BASE SERVICES: INTERVIEW PROGRAM ..... | 203 |
| APPENDIX E: | QUESTIONNAIRE ..... | 205 |




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# MARKET OPPORTUNITIES
# FOR DATA BASE SERVICES

## LIST OF EXHIBITS


| | | | Page |
|---|---|---|---|
| II | -1 | Forecast Of Total Data Base Services Market, 1979-1985 | 7 |
| | -2 | Forecast Of On-Line Data Base Services Market By Vendor Type, 1979-1985 | 8 |
| | -3 | Forecast Of On-Line Data Base Services Market By Industry Sector, 1979-1985 | 10 |
| | -4 | Forecast Of On-Line Data Base Services Market By Data Base Subsector, 1979-1985 | 12 |
| III | -1 | On-Line Data Base Services Market Participants | 23 |
| | -2 | Intermediaries Using On-Line Data Base Services | 26 |
| | -3 | Typical End Users Of On-Line Data Base Services | 27 |
| | -4 | Technologies Supporting On-Line Data Base Services' Growth | 28 |
| | -5 | Market Segmentation Of On-Line Data Base Services According To Type | 31 |
| | -6 | Forecast Of User Expenditures For On-Line Data Base Services By Vendor Type, 1979-1985 | 35 |
| | -7 | Forecast Of User Expenditures For On-Line Data Base Services By Industry Sector, 1979-1985 | 36 |
| | -8 | Advanced Technologies Related To On-Line Data Base Systems | 38 |
| | -9 | IBM Disk Storage Cost Per Bit At Date Of Announcement | 41 |
| | -10 | On-Line Storage Costs | 42 |
| | -11 | Vertical Integration In On-Line Data Base Services Markets By Publishing Firms | 44 |
| | -12 | Vertical Integration In On-Line Data Base Services Markets By Communications Vendors | 46 |
| IV | -1 | Forecast Of User Expenditures For Econometric On-Line Data Base Services By Vendor Type, 1979-1985 | 50 |
| | -2 | Forecast Of User Expenditures For Econometric On-Line Data Base Services By Industry Sector, 1979-1985 | 51 |
| | -3 | Forecast Of User Expenditures For Securities And Commodities On-Line Data Base Services By Vendor Type, 1979-1985 | 58 |
| | -4 | Forecast of User Expenditures For Securities And Commodities On-Line Data Base Services By Industry Sector, 1979-1985 | 59 |
| | -5 | Forecast Of User Expenditures For Financial And Economic On-Line Data Base Services By Vendor Type, 1979-1985 | 64 |
| | -6 | Forecast Of User Expenditures For Financial And Economic On-Line Data Base Services By Industry Sector, 1979-1985 | 66 |
| | -7 | Forecast Of User Expenditures For Demographic On-Line Data Base Services By Vendor Type, 1979-1985 | 76 |



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| | | | Page |
|---|---|---|---|
| | -8 | Forecast Of User Expenditures For Demographic On-Line Data Base Services By Industry Sector, 1979-1985 | 78 |
| | -9 | Forecast of User Expenditures For Resources On-Line Data Base Services By Vendor Type, 1979-1985 | 82 |
| | -10 | Forecast Of User Expenditures For Resources On-Line Data Base Services By Industry Sector, 1979-1985 | 83 |
| | -11 | Forecast Of User Expenditures For Industry On-Line Data Base Services By Vendor Type, 1979-1985 | 88 |
| | -12 | Forecast Of User Expenditures For Industry On-Line Data Base Services By Industry Sector, 1979-1985 | 89 |
| | -13 | Forecast Of User Expenditures For Legal/Accounting On-Line Data Base Services By Vendor Type, 1979-1985 | 98 |
| | -14 | Forecast Of User Expenditures For Legal/Accounting On-Line Data Base Services By Industry Sector, 1979-1985 | 99 |
| | -15 | Forecast Of User Expenditures For News On-Line Data Base Services By Vendor Type, 1979-1985 | 104 |
| | -16 | Forecast Of User Expenditures For News On-Line Data Base Services By Industry Sector, 1979-1985 | 106 |
| | -17 | Forecast Of User Expenditures For Marketing On-Line Data Base Services By Vendor Type, 1979-1985 | 111 |
| | -18 | Forecast Of User Expenditures For Marketing On-Line Data Base Services By Industry Sector, 1979-1985 | 113 |
| | -19 | Forecast Of User Expenditures For Credit On-Line Data Base Services By Vendor Type, 1979-1985 | 117 |
| | -20 | Forecast Of User Expenditures for Credit On-Line Data Base Services By Industry Sector, 1979-1985 | 119 |
| | -21 | Forecast Of User Expenditures For Bibliographic On-Line Data Base Services By Vendor Type, 1979-1985 | 123 |
| | -22 | Forecast Of User Expenditures For Bibliographic On-Line Data Base Services By Industry Sector, 1979-1985 | 125 |
| | -23 | Forecast Of User Expenditures For Properties On-Line Data Base Services By Vendor Type, 1979-1985 | 130 |
| | -24 | Forecast Of User Expenditures For Properties On-Line Data Base Services By Industry Sector, 1979-1985 | 131 |
| | -25 | Forecast Of User Expenditures For Real Estate On-Line Data Base Services By Vendor Type, 1979-1985 | 136 |
| | -26 | Forecast Of User Expenditures For Real Estate On-Line Data Base Services By Industry Sector, 1979-1985 | 137 |
| | -27 | Forecast Of User Expenditures For International On-Line Data Base Services By Vendor Type, 1979-1985 | 141 |
| | -28 | Forecast Of User Expenditures For International On-Line Data Base Services By Industry Sector, 1979-1985 | 143 |
| | -29 | Forecast Of User Expenditures For Other On-Line Data Base Services By Vendor Type, 1979-1985 | 150 |
| | -30 | Forecast Of User Expenditures For Other On-Line Data Base Services By Industry Sector, 1979-1985 | 151 |
| V | -1 | Typical Data Base Pricing Arrangements For On-Line Data Base Services | 158 |




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| | | | Page |
|---|---|---|---|
| VI | -1 | Data Base Vendors' Share Of On-Line Data Base Services Market In 1979 | 173 |
| | -2 | Remote Computing Vendors' Share Of On-Line Data Base Services Market in 1979 | 175 |
| A | -1 | Forecast Of User Expenditures For On-Line Data Base Services By Vendor Type, 1979-1985 | 189 |
| | -2 | Forecast Of User Expenditures For On-Line Data Base Services By Industry Sector, 1979-1985 | 190 |
| | -4 | Forecast Of User Expenditures For On-Line Data Base Services by Data Base Subsector, 1979-1985 | 191 |



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# 1 INTRODUCTION AND SCOPE

# I INTRODUCTION AND SCOPE

## A. INTRODUCTION

- This report, produced by INPUT as part of the Market Analysis Service, analyzes market opportunities for on-line data base services.

- This area of research was selected because of high client interest and accelerating market growth.

- The purpose of this study is to analyze both present and future markets and to provide the basic technical background and recommendations for both market entry and expansion.

- Interviews were conducted during April and May 1980.

- The research conducted in this report includes 50 vendor interviews distributed as shown in Appendix D.

- Extensive review of vendor-produced literature and follow-up interviews added to the comprehensiveness of the analysis conducted.

- A copy of the questionnaire is included in Appendix E.

- Definitions of terms used in this report appear in Appendix B.


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- The forecasts in this report include a 6% annual factor for inflation. The difference between 6% and the annual increase in the Gross National Product (GNP) Deflator is assumed to be offset by technology improvements.

- Inquiries and comments from clients on the information presented in this report are invited.

## B. SCOPE

- This study considers markets for data base services in the U.S. For example, the use of international data bases by U.S. firms is included, whereas revenues from the sale of U.S. bibliographic data base services in Europe are not.

- The report deals with markets and opportunities for data base services delivered by remote computing services (RCS).

- There are a number of other data delivery methods, such as printed report services, tape services, consulting services, seminars, etc. Markets for data base services using other delivery methods, while mentioned, are not forecasted in detail.

- The study forecasts user expenditures for data base related services resulting in revenues to computer services vendors, data base vendors and distribution vendors.

- End user expenditures by individuals (including consumers) are considered. However, the research focuses primarily on end user expenditures by corporations.

- Although data base related services used by governments are considered, the report concentrates on the commercial sector of the U.S. economy.


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- Government fees from the sale of both data base services and data to data base services vendors are not included in market figures.


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## II EXECUTIVE SUMMARY

- Businesses, governments and other organizations are developing an almost insatiable appetite for organized information, called data bases. The term "data base" is used for recognition purposes but "non-data" bases in textual and, eventually, graphic form are increasing rapidly in importance. In the future, a more accurate designation ("information bases") will be used.

- Rather than collecting the data internally, executives have found it increasingly cost effective to obtain data bases from outside sources.

- Outside sources deliver data bases in a variety of forms:

  - By printed publications such as directories and abstracts.

  - By automated means off-line, such as magnetic tape and microfiche.

  - By automated means on-line, through interactive remote computing services (RCS).

### A. MARKET FORECAST

- INPUT forecasts that users spent in excess of $10 billion in 1979 for all types of data base services from outside sources.


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- As shown in Exhibit II-1, the total market, growing at 14% AAGR over the forecast period, will exceed $22 billion in 1985.

- New forms of information bases evolving from technological advances have the potential for explosive growth as the decade advances.

- User expenditures in 1979 for on-line data base services were $1.2 billion, or 13% of total expenditures. They will grow at over 24% annually until they reach almost $4.3 billion in 1985.

- As shown in Exhibit II-2, user expenditures are for three vendor services:

  - Subscription and royalty fees to data base vendors, paid either directly or through RCS vendors.

  - Access and usage charges to RCS vendors.

  - Telecommunication charges to distribution vendors, such as Telenet and TYMNET.

- RCS vendor revenues for on-line data base related services, 76% of total user expenditures, will grow at a 24% annual rate over the forecast period, exceeding the average growth rate (21%) for all RCS services.

- On-line data base services represent over 25% of total 1979 RCS user expenditures.

- Recognizing the inherent value of proprietary data, data base vendors will achieve a 26% AAGR in revenues over the forecast period through subscriptions and royalties for on-line data bases: revenues from this source will exceed $1 billion by 1985.

- Distribution vendors, even with a 26% AAGR, will remain a small (2%) but important part of the market until the later 1980s when new distribution


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EXHIBIT II-1

FORECAST OF TOTAL DATA BASE
SERVICES MARKET, 1979-1985

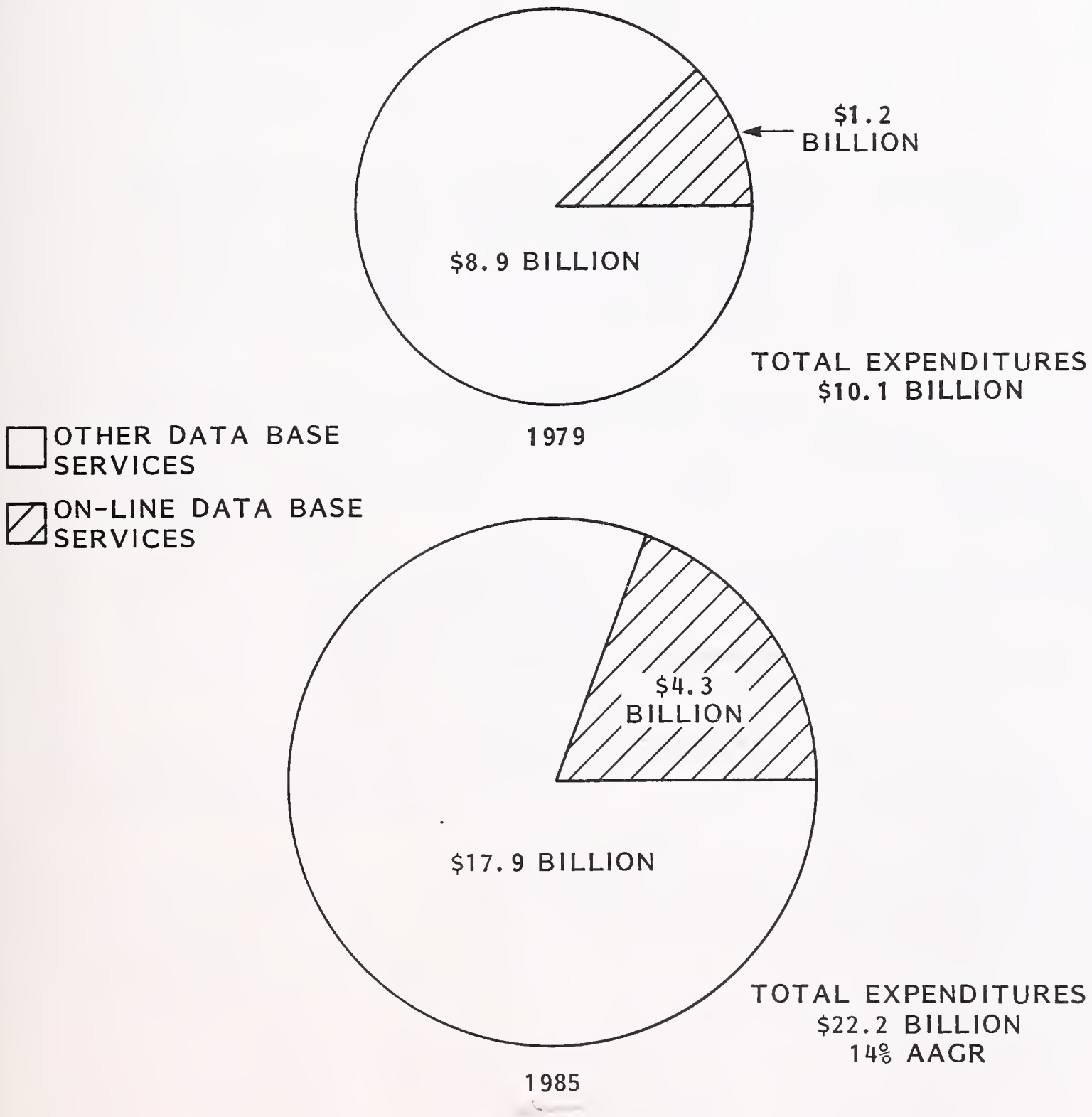



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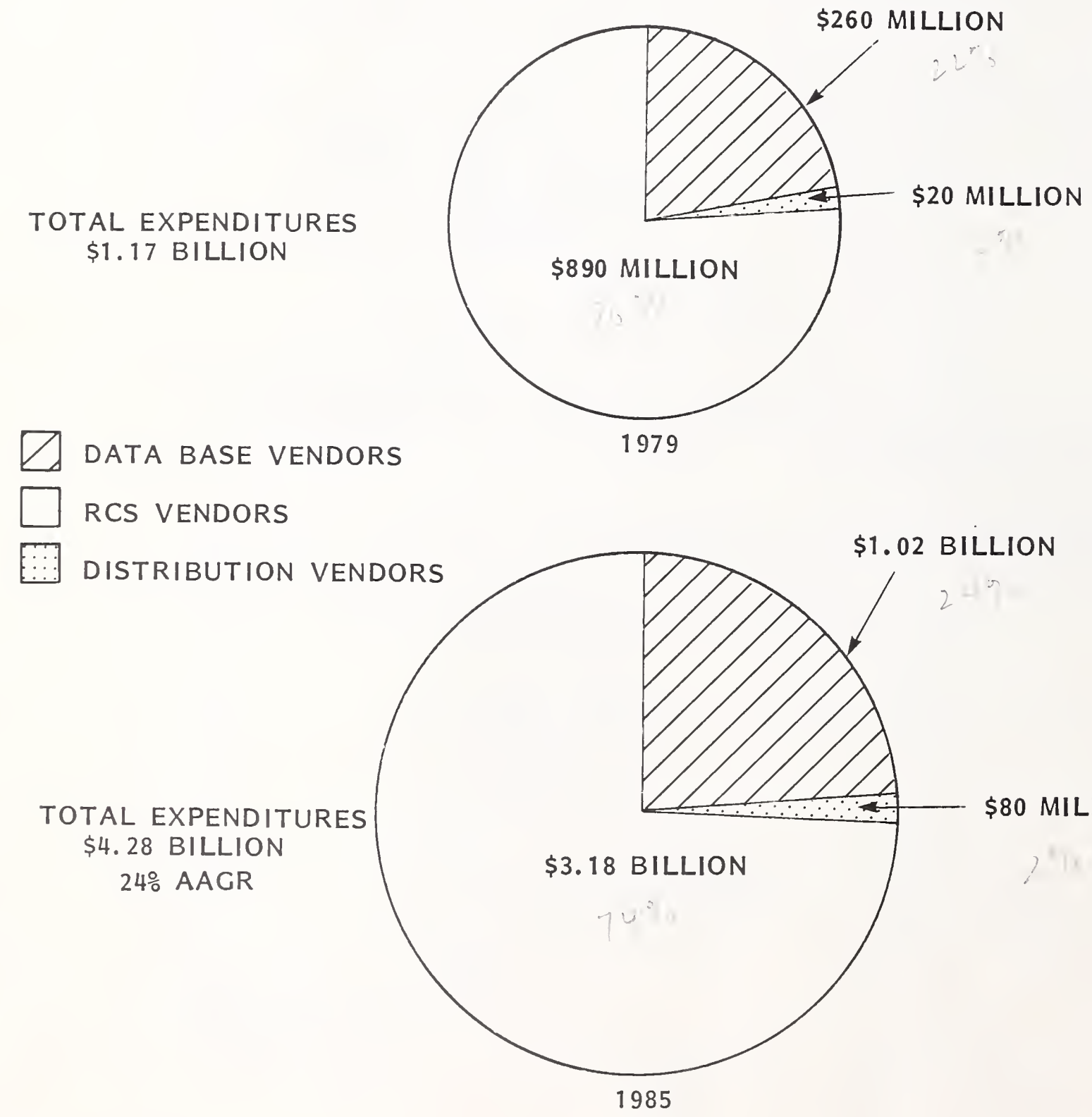
EXHIBIT II-2

FORECAST OF ON-LINE
DATA BASE SERVICES MARKET BY VENDOR TYPE,
1979-1985





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channels and vertical integration change the character of the on-line data base marketplace. AT&T, GTE and others will have their major impact after 1985.

- The most attractive industry sectors for on-line data base service offerings are shown in Exhibit II-3. Six sectors account for over 75% of total 1979 expenditures.

- The manufacturing sector, with 1985 revenues approaching $1 billion, will have the highest AAGR (28%) as a result of individual growth rates of up to 40% associated with marketing, legal, resources, properties and news data base services provided to both process and discrete manufacturing companies.

- Banking and finance, with 23% of total expenditures, is currently the largest on-line data base services market sector. Over 90% of the $270 million in expenditures is related to four types of data bases: econometric, securities and commodities, financial and economic, and credit.

- Incremental expenditures, exceeding $600 million in the services sector by 1985, will come from real estate, credit and legal on-line data base services, and from "other" data base services such as those for leisure and personnel.

- Growth in user expenditures to $0.5 billion in the retail sector by 1985 will come from consumer-oriented services. Services related to credit and marketing data bases will account for 85% of total 1985 expenditures.

- Travel agency automation accounts for the major portion (90%) of transportation sector growth.

- Besides being a source of both data bases and on-line data base services, the government sector, with $50 million in 1979 expenditures, is also a significant user of on-line data base services.


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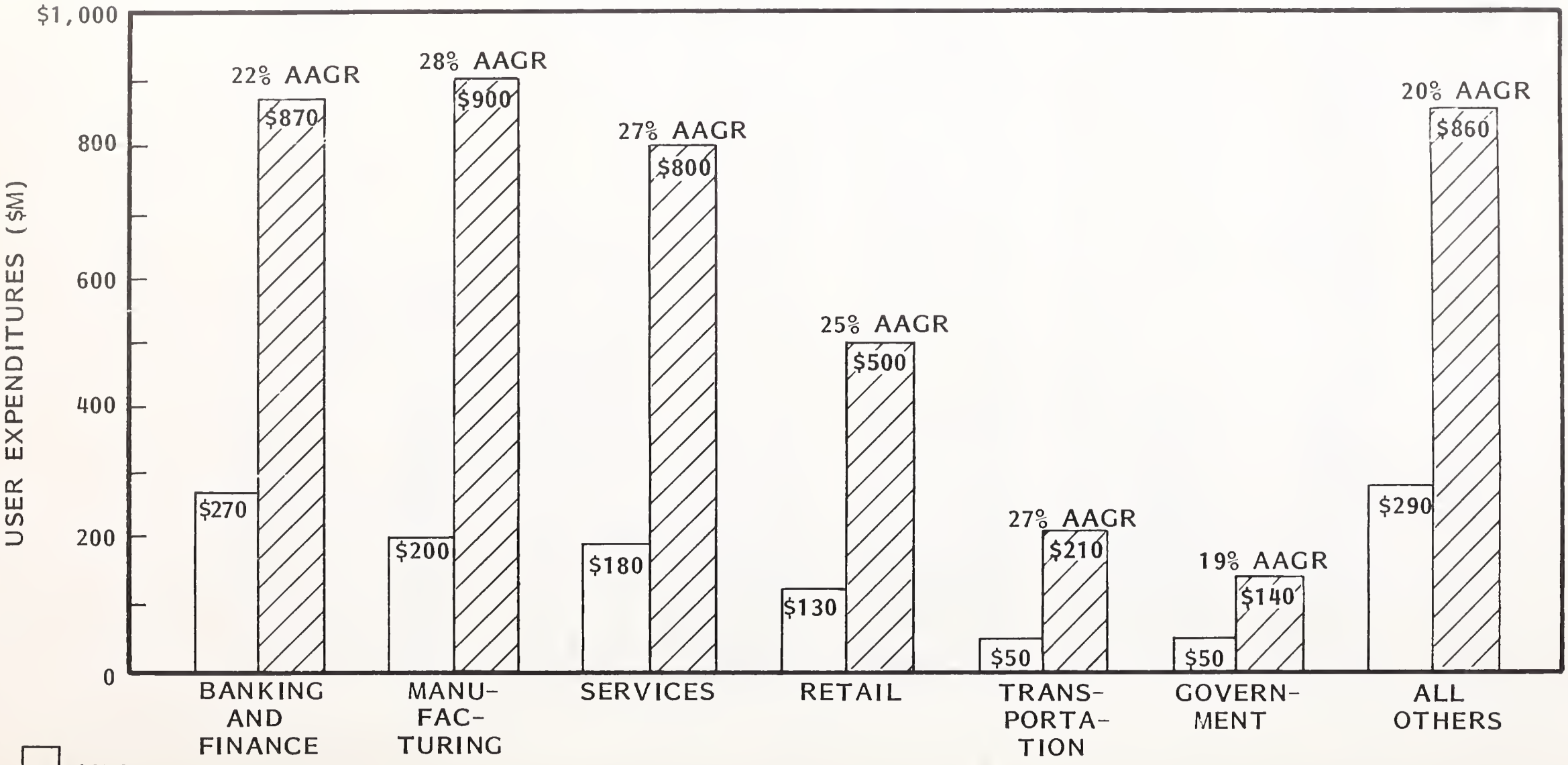
EXHIBIT II-3

FORECAST OF ON-LINE DATA BASE SERVICES MARKET BY INDUSTRY SECTOR,
1979-1985

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- Four data base types - legal, bibliographic, financial and economic, and securities and commodities - account for over 80% of total 1979 government expenditures for on-line data base services.

- The market for on-line data base services is highly diversified.

  - Well over 400 data bases are available on-line.

  - Over 140 vendors create and maintain data bases.

  - Over 60 RCS vendors offer on-line data base services.

- As the best method of determining market size and growth, the market was divided into the 15 subsectors shown in Exhibit II-4.

- Credit services, with offerings in commercial and consumer credit, check guarantee and credit card authorization, is the largest subsector. Credit on-line data base services comprise over 20% of the total market.

- Three other subsectors, in which user expenditures exceed $100 million, are major markets.

  - Securities and commodities.

  - Financial and economic.

  - Marketing.

- Special marketing opportunities exist in four subsectors, where growth rates are 30% or greater.

  - Spurred by the continuing energy crisis, growth will be greatest (35% AAGR) in the resources subsector.


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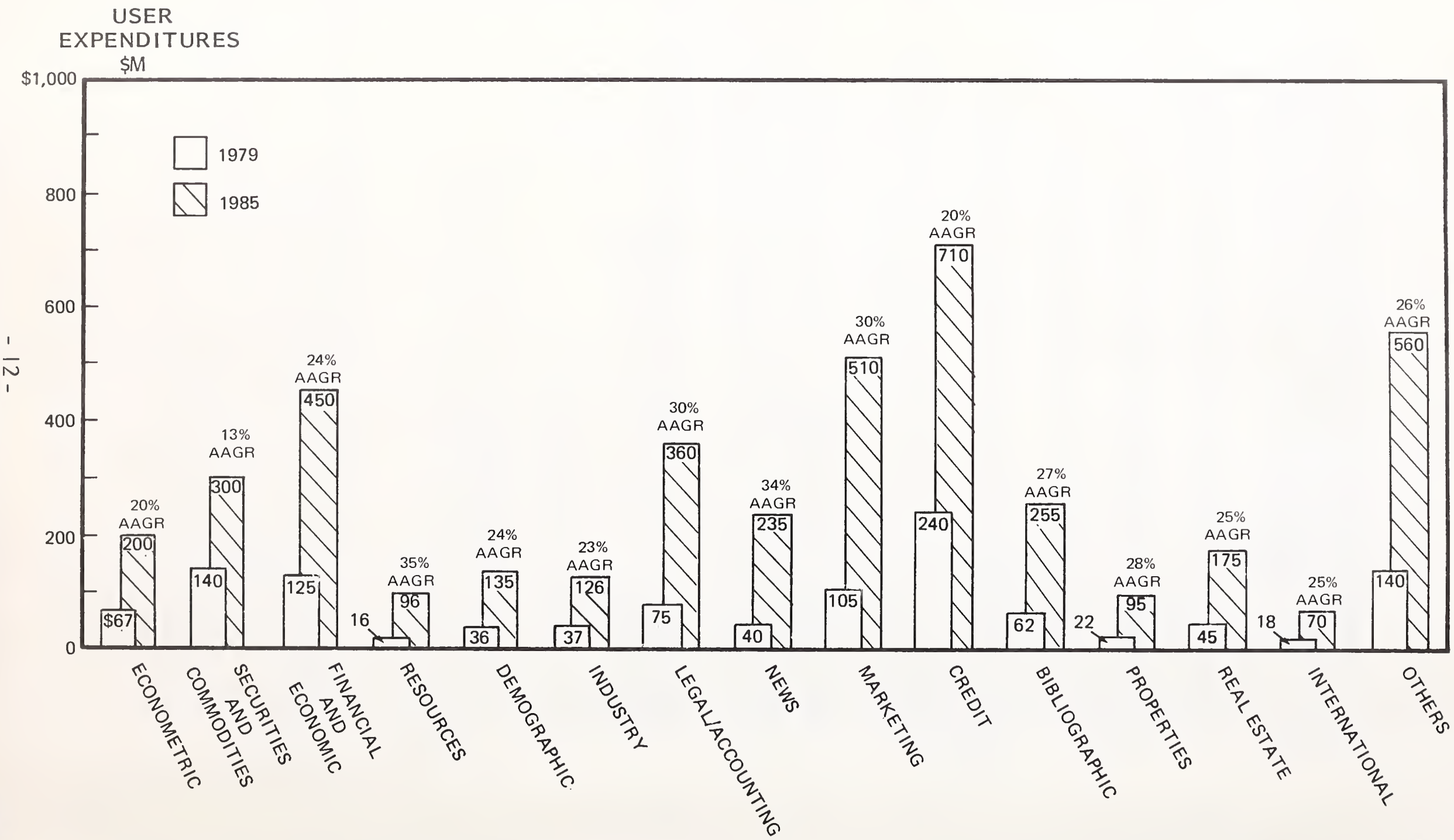
EXHIBIT II-4

FORECAST OF ON-LINE DATA BASE SERVICES MARKET BY DATA BASE SUBSECTOR,
1979-1985

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- Accelerated growth (34% AAGR) in the news sector will come as NEXIS, The Information Bank and wire services gear up to assault the corporate marketplace.

- Significant growth (30% AAGR) in the legal/accounting subsecter will result from new moves by Westlaw, and expansion by Mead's LEXIS into small law firms.

- Automated data gathering and expansion of market research into other consumer areas will result in high growth (30% AAGR) in the marketing subsector.

- Detailed analysis of each data base market subsector, the heart of this report, is found in Chapter IV, Market Analysis By Data Base Subsector.

## B. FUTURE TRENDS

- Merging technological and market forces will result in explosive growth in markets for on-line data base systems in the late 1980s.

- Advanced technologies include:

  - Wideband information distribution channels, including satellites, fiber optics and coaxial cable communication.

  - Imaging data entry systems, such as data scanners and video imaging.

  - Consumer terminals, including home TV/telephones costing less than $100.

  - Office automation systems, effectively integrating such functions as word processing, electronic mail and filing.


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- Mass storage devices, including video disk, with an increase of two or more orders-of-magnitude storage capacity at less than current prices.

- Market forces at play include:

  - Vertical integration through acquisition by major publishers such as McGraw-Hill.

  - Expansion of major distribution vendors such as GTE and ITT into both commercial and consumer on-line data base markets. Experiments such as Telidon and Prestel (Viewdata) will continue in this area.

  - Market entry and expansion by communications firms, including newspapers and wire services such as Knight Ridder and Dow Jones.

  - Entry of foreign-based vendors such as European Space Agency (IRS) into the U.S. marketplace.

  - Emergence of new, consumer-oriented networks such as The Source, Micronet and the H.R. Block (Compuserve)/Tandy combination.

- The net result will be a huge increase in information available through on-line data base services to both corporate users and consumers, replacing increasingly expensive labor- and resource-intensive printed publications.

- The RCS mode of delivery for data base services is limiting the paper-based market. Similarly, new methods of delivery will impact RCS in the late 1980s: in particular, image storage systems used for data/image/audio combinations.

- INPUT believes that major vendors, including IBM, XEROX, ITT, AT&T and GTE, are positioning themselves to participate in what could well be a 1990 market in excess of $10 billion.


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## C. RECOMMENDATIONS

### 1. MANAGEMENT

- INPUT recommends that vendors give special attention to on-line data base market opportunities. Every processing services vendor should be in this business: even highly specialized vendors should provide data bases associated with their specialties.

### 2. MARKETING

- Companies in the business should continuously seek qualified marketing support personnel and provide specialized support for each type of service:
  - Ph.D. econometricians for econometric data base services.
  - M.B.A. graduates for economic and financial data base services.
  - Lawyers for legal data base services.
  - Process engineers for properties data base services.
  - Information specialists for bibliographic data base services.
  - Geologists for resource data base services.
- Acquire speciality data base vendors and intermediary search firms.
  - Look for arrangements that include proprietary software.
  - If acquisition is impossible, use joint ventures or other means to obtain exclusivity.


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- Establish a comprehensive plan to train end users in the availability and use of on-line data base systems.

- Offer seminars to both prospective corporate managers and end users. Managers do not often know what data bases are available or how on-line data base services can enhance their competitive position.

- Differentiate on-line data base offerings from competition.

  - Look for exclusiveness in licensing arrangements.

  - Integrate data bases with proprietary application software.

- Stress "ease of use" in market offerings.

  - The market trend is toward "user-friendly" interfaces.

  - End users shy away from systems that don't speak their language.

- Establish market presence by aiming services at specific, rather than general, needs in a selected market. For example, use a commodity data base with proprietary software for "hedging" investments. General services may be added around the special service.

- Offer total on-line data base services:

  - Data bases.

  - Proprietary system and application software at the terminal and central site.

  - Network.

  - General purpose terminals (intelligent, micro, mini).


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- Terminal maintenance.

- Track developments closely in evolving on-line corporate information data base markets. Many of the successful data base opportunities for 1985 have not yet been identified. Competition, however, will be fierce, so close monitoring and rapid movement will be characteristic of successful vendors.

- Look for opportunities to participate in the market for on-line data base services to consumers.

  - Vendors should observe and conduct market research on on-line information markets to consumers. Otherwise, they will be forced to respond to moves by competition under highly unfavorable lead-time conditions.

  - Vendors should be particularly concerned with the interfaces their present customers have with consumers.

- Data base services should be sold by existing sales forces as part of the overall product offerings. Separate sales forces are not recommended.

3. PRODUCT

- Contact trade and professional associations to determine data available for data base offerings. Offer services to automate association data.

- Look for situations where users needing on-line data base services will help create them by supplying data in automated form such as magnetic tape.

- State and county governments are an untapped source. Contact federal, state and county agencies to determine available data and who uses it.


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- Contact specialty publishers of technical and marketing information. Offer text editing, word processing and electronic publishing services to automate data bases as by-products of printed publications.

- Consumer data bases have high value added potential. Contact market research firms dealing with the consumer marketplace.

- Contact engineering and technical consulting firms dealing in capital-intensive industries such as public utilities, construction, exploration and development.

- Contact foreign research bureaus and firms for availability of international data bases.

- Reformat, build and maintain data bases with advanced implementation languages offering efficient access and search techniques.

- Vendors must provide clients with means of applying the information obtained from a data base. Vendors should develop or license proprietary application software to use in conjunction with data base offerings.

  - Bundling software with data bases results in double "value added" offerings.

  - Offering proprietary software is probably the best way to expand revenue from on-line data base offerings.

- Develop user-friendly system interface software to reference and access all data base offerings.

  - Standardize the data base access method.

  - Lead users through the system.

  - Develop syntax that can be targeted to the end users' own terms.


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- Develop or license model-building software to support end users' model building using econometric measurement or financial management and planning techniques.

- Develop on-line data base service offerings that operate on general purpose terminals.

  - Interface with terminals which are part of minicomputer-controlled word processing/office automation systems.

- Use minicomputers as part of on-line data base offerings:

  - As the host computer for specialized offerings.

  - As user site hardware services for distributed data base offerings using selective dissemination techniques.

- Offer on-line data base systems that are reliable and responsive.

  - Reliability is a major ingredient when on-line data base services are integrated with user mainline daily operations.

  - End users quickly sense when the system is unresponsive.

- Produce data bases that have adequate scope, are built with adequately validated data, and contain data that are updated in a timely manner.


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# III MARKET ANALYSIS AND FORECAST

## III MARKET ANALYSIS AND FORECAST

- People, as individuals, employees, managers and executives, are finding it increasingly necessary to have access to more and varied data in order to make decisions.

  - In most cases they cannot economically collect the data themselves and thus look to outside sources.

  - At the same time, computer and communications systems have enabled the economical collection, aggregation, organization and delivery of such data on behalf of groups of people.

- Characteristics of potential data base opportunities are:

  - The quantity of data is large and expensive to collect.

  - The data require frequent and expert updating.

  - The data are unique.

  - No satisfactory alternative is available.

- For a data base to be useful, it must be well organized and tools must be available for effective use. Outside data can be purchased (leased) through:


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- Gathering the data directly through market research firms or consultants.

- Finding the data available in printed form from publishers.

- Magnetic tape from data base vendors.

- On-line access from RCS vendors.

- The market analysis and forecast that follows covers the market for data base services delivered on-line through RCS vendors and generally available for purchase.

## A. MARKET STRUCTURE

### 1. MARKET PARTICIPANTS

- The market for on-line data base services includes five participants. Their interrelationship is shown in Exhibit III-1.

#### a. Data Base Vendors

- Data base vendors, such as Arnold Bernhard & Co., create and maintain data bases (Value Line), usually as a by-product of a report service or publication. The data base is created using original key entry, frequently in conjunction with electronic publishing and, more recently, as a result of office automation.

- Data base vendors more frequently offer data bases through remote computing services (RCS) vendors, such as Automatic Data Processing (ADP). However, these vendors may also offer data base services either directly through their private data networks or through those of distribution vendors.


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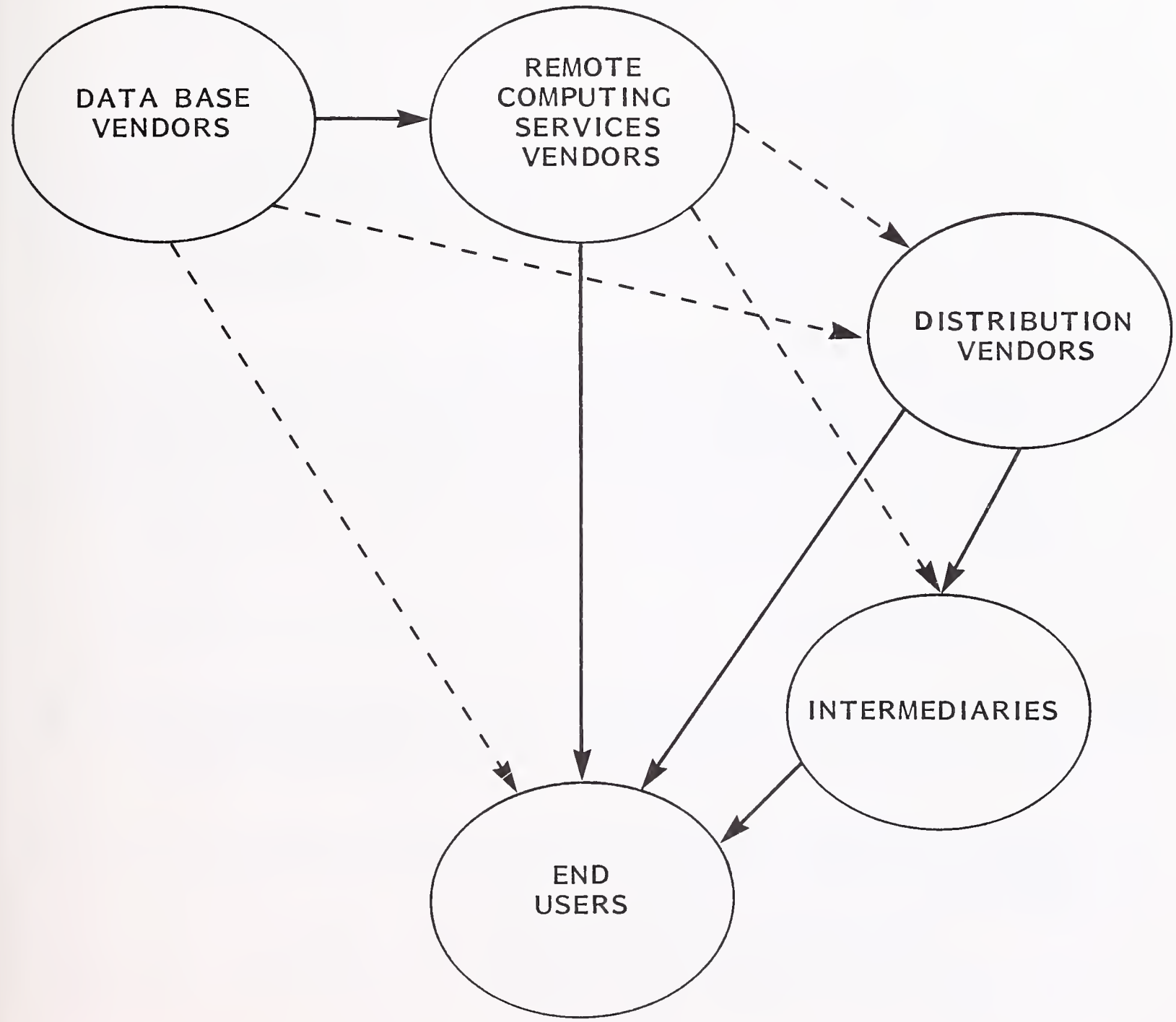
EXHIBIT III-1

ON-LINE DATA BASE SERVICES MARKET PARTICIPANTS





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b. RCS Vendors

- RCS vendors offer data base services either through their own distribution channels (such as GEISCO) or through distribution vendors (as in the case of Lockheed's DIALOG).

- RCS vendors, such as Interactive Market Systems, offer value added services using data base vendor products or, as in the case of Data Resources Inc. (DRI), integrate data base creation and maintenance with RCS services.

c. Distribution Vendors

- Distribution vendors, currently TYMNET and Telenet (GTE) in the U.S. marketplace, enable both data base and RCS vendors to offer on-line data base services to a large number (greater than 20,000) of widely dispersed intermediaries and end users.

- Other distribution vendors will emerge in the next five years and attempt to replace RCS vendors as the prime means of distribution for data base vendors. These vendors will be telecommunications companies such as GTE and possibly AT&T.

d. Intermediaries

- Intermediaries, such as consultants, use data base services to search and gather information for end users (e.g., the public information officer).

- There are a number of factors related to participation of intermediaries in the market.

  - End users find many on-line data base systems difficult to understand.

  - Intermediaries are trained in search techniques.


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- Intermediaries are familiar with multiple systems.

- Intermediaries are articulate when referring to data base dictionaries and indices.

- Examples of intermediaries using on-line data base systems are shown in Exhibit III-2.

  - Commercial search firms, such as Capitol Systems Group Inc., knowledgeable in both automated information availability and on-line access and search software from a wide variety of data base services vendors, are both a valuable source of market expertise and an important market segment.

e. End Users

- A wide variety of end users directly access on-line data bases using primarily general purpose CRT and hard copy terminals, but also specialized terminals such as those used by Quotron Systems or Mead for LEXIS.

- Typical end users of on-line data base services are listed in Exhibit III-3.

2. SUPPORTING TECHNOLOGIES

- Technologies that have fostered the rapid growth of on-line data base services are shown in Exhibit III-4.

- The economies of scale afforded by large-scale computers, simultaneously timeshared by thousands of users, with increasing computational capability per unit cost, represent an essential ingredient for market growth.


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EXHIBIT III-2

## INTERMEDIARIES USING ON-LINE DATA BASE SERVICES

- UNIVERSITY LIBRARIANS
- LIBRARIANS AT CORPORATE INFORMATION CENTERS
- COMMERCIAL SEARCH SERVICES
- CORPORATE INFORMATION SPECIALISTS
- LAW CLERKS
- LIBRARIANS AT GOVERNMENT INFORMATION CENTERS
- LABORATORY ASSISTANTS


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EXHIBIT III-3

TYPICAL END USERS OF ON-LINE DATA BASE SERVICES

| END USERS | APPLICATION | DATA BASE | RCS VENDOR | DISTRIBUTION VENDOR |
|---|---|---|---|---|
| CORPORATE EXECUTIVE | ACQUISITION ANALYSIS | COMPUSTAT | SBC | - |
| STRATEGIC PLANNER | HOUSING INDUSTRY FORECAST | REGIONAL DATA ASSOCIATES | IDC | - |
| LAWYER | DUE DILIGENCE | LEXIS | MEAD | - |
| ADVERTISING EXECUTIVE | MEDIA ANALYSIS | ARBITRON | INTERACTIVE MARKET SYSTEMS | TYMNET |
| INVESTMENT MANAGER | PORTFOLIO PRICING | TELSTAT | TYMSHARE | - |
| SCIENTIST | CHEMICAL TOXICITY | CAS | SDC SEARCH | TYMNET |
| ENGINEER | PROCESS DESIGN | CHEMSHARE | UCC | - |
| TREASURER | MONEY MARKET INVESTMENT | QUOTRON | QUOTRON | - |
| SECURITIES BROKER | BLOCK TRADING | AUTEX | AUTEX | - |
| BUSINESS ECONOMIST | PULP MARKET FORECAST | PULP DATA BANK | DRI | - |
| ECONOMETRICIAN | INTEREST RATE FORECAST | FINANCIAL DATA BANK | CEAI | - |

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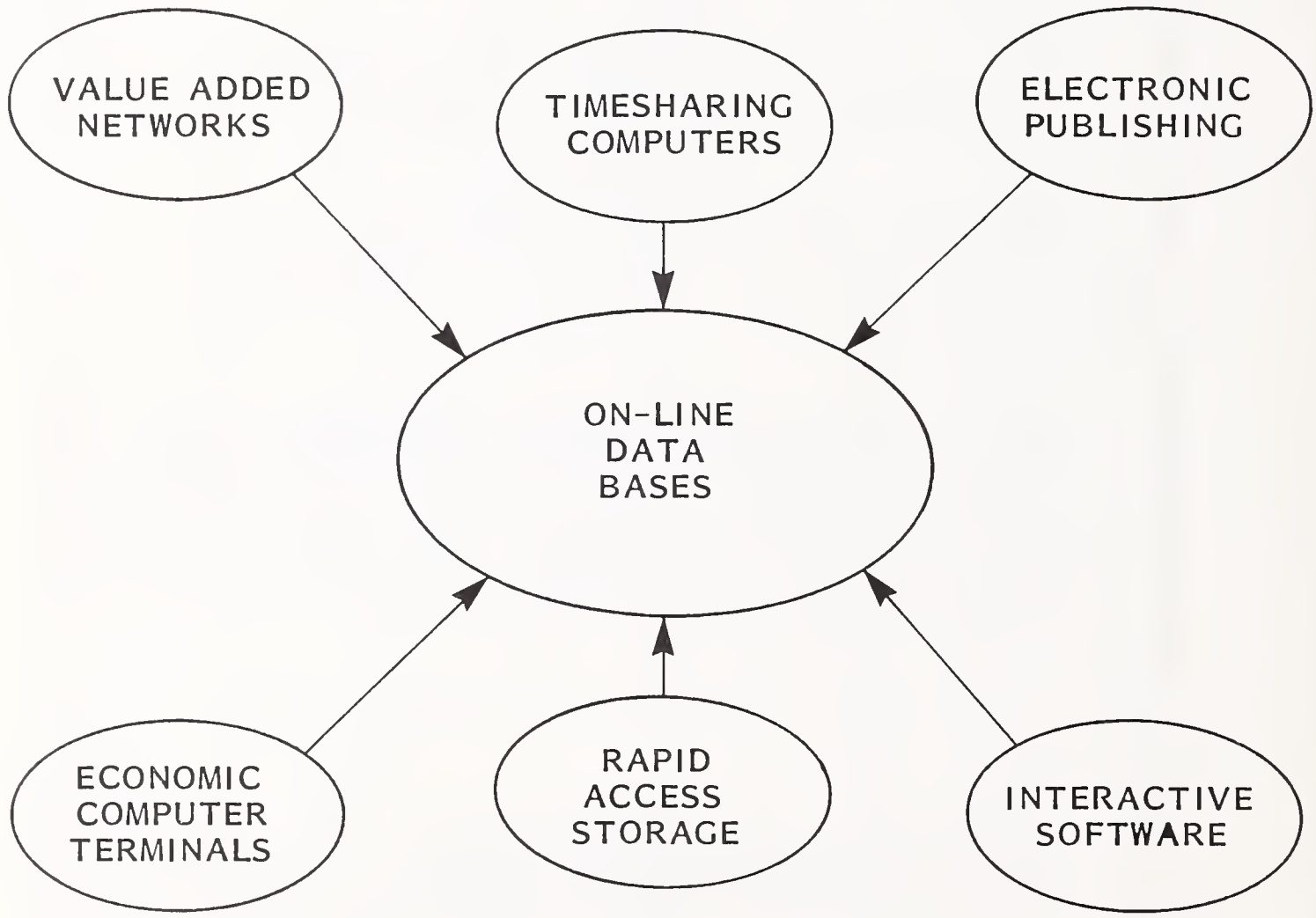
EXHIBIT III-4

TECHNOLOGIES SUPPORTING ON-LINE DATA BASE SERVICES' GROWTH





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- The emergence of electronic publishing, whereby data bases are created as a by-product of using computer-controlled methods of data entry, composition, editing and publication, has greatly reduced direct data base construction and maintenance costs.

- System software, including timesharing operating systems, DBMS, access, search and modeling software, is becoming more "user friendly" and text oriented.

- The simultaneous increase in capacity and decrease in cost of rapid-access disk storage is resulting in a decline in unit storage costs exceeding 30%/year.

- Increasing intelligence, coupled with the decreasing cost of general-purpose computer terminals, is resulting in terminal lease costs below $100/month.

- The development of networks allows access to on-line data bases by a large number of dispersed users at reasonable costs.

- All supporting technologies are reducing the cost/unit of electronically delivered information at a time when printing and paper distribution costs (highly labor-intensive and energy-dependent) are rapidly escalating.

## 3. MARKET DEFINITION

- An initial look at the market for on-line data base services indicates that subsector definition is necessary.

  - INPUT has identified over 400 available data bases.

  - The data bases themselves cover a wide diversity of subject matter, disciplines, and data content.

  - Services are offered across virtually all industry sectors.


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- After reviewing existing definitions of data base structure, INPUT decided on the subsector split shown in Exhibit III-5 to determine market size and growth.

- Econometric data bases, associated primarily with aggregate economic forecasting using sophisticated analysis and modeling software and usually requiring the consulting services of highly trained (Ph.D.) personnel, contain time series of historic and forecast data.

- Securities and commodities data bases, real-time in nature, are associated with daily market operations of the major national stock and commodity exchanges.

- Financial and economic data bases, associated primarily with microeconomic and financial activity of business (both industrial and financial), support corporate market, financial and strategic planners, and contain time series of primarily historic data.

- The separate classifications of resources and industry data bases highlight their growing importance in the marketplace.

  - Resources data bases are on natural resources such as oil, coal, gas and iron. Industry data bases are unique to particular industries other than those, such as credit, that are separately classified. They include medical, real estate and manufacturing.

- News data base services, a market of explosive growth potential, contain vendors that supply financial news services data bases to securities and commodities data base services vendors. To the extent that financial news data base services could be separately identified, they were included in that subsector.


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EXHIBIT III-5

## MARKET SEGMENTATION OF ON-LINE DATA BASE SERVICES ACCORDING TO TYPE

- ECONOMETRIC
- SECURITIES AND COMMODITIES
- FINANCIAL AND ECONOMIC
- DEMOGRAPHIC
- RESOURCES
- INDUSTRY
- LEGAL/ACCOUNTING
- NEWS
- MARKETING
- CREDIT
- BIBLIOGRAPHIC
- PROPERTIES
- REAL ESTATE
- INTERNATIONAL
- OTHER



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- International data bases, classifiable under other types such as econometric, financial and economic or resources, were also separated in order to highlight the number and diversity currently becoming available to U.S. companies through U.S. RCS vendors.

- Data bases that could not be classified in the selected 14 sectors, along with consumer-oriented data bases, are included in the subsector "Other."

## B. MARKET FORECAST

### 1. METHODOLOGY

- The study forecasts user expenditures for on-line data base services.

- The forecast includes primarily end user expenditures by corporate entities such as industrial companies and financial institutions.

- User expenditures by governments are forecasted, but end user expenditures for data base subscriptions and data base services offered by government agencies are not.

- Expenditures by some individuals (such as investors as end users) are included, but expenditures for "the consumer sector" are not. They are expected to be small until the later 1980s.

- The forecast is limited to U.S. user expenditures; thus expenditures for data base services by foreign entities which are reported as part of U.S. vendors' gross revenues are excluded.

- The forecast includes end user expenditures for three vendor types:

  - Data base vendors.


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- RCS vendors.

- Distribution vendors.

- Where data base vendors such as Data Courier, Inc. offer data bases on subscription (royalty) through RCS vendors, expenditures for subscription services are separately forecast. Every attempt was made to avoid "double counting." User expenditures for data base vendor subscriptions were subtracted from RCS vendors' total revenues for data base services.

- No attempt was made to separate end user expenditures for data base subscriptions for data bases created and maintained by RCS vendors (such as DRI or IDC) from end user expenditures for RCS services. Data base vendors such as Marshall and Swift, offering on-line data base services either directly or through distribution vendors, were classified as RCS vendors.

- End user expenditures for on-line data base distribution services were limited to value-added network vendors, TYMNET and Telenet. User expenditures for RCS vendor network services are included as part of total end user expenditures for RCS data base services.

- Each of the 15 subsectors listed in Exhibit III-5 was separately forecasted (see Chapter IV, Market Analysis By Data Base Subsector).

  - The six industry sectors with highest total 1979 end user expenditures were retained for additional analysis. End user expenditures for the rest were included in total end user expenditures for the "other" sector.

  - The subsectors were summarized by vendor type and industry sector.

2. FORECAST OF USER EXPENDITURES

- The market for on-line data base services is by all measures outstanding.


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- End user expenditures for all services, already exceeding $1 billion in 1979, will grow to over $4 billion annually by 1985, a 24% annual growth rate over the forecast period.

- As shown in Exhibit III-6, expenditures for RCS vendor services (remote computing plus "own" data base royalties) make up over 75% of the total 1979 marketplace. INPUT expects them to retain their share of the market over the forecast period, although it may erode from 1985 onwards.

- User expenditures for on-line data base RCS services in 1979 exceeded 25% of total expenditures for all RCS services as forecast in INPUT's Market Analysis Service (MAS) 1979 Annual Report on the Computer Services Industry.

- Data base vendors, recognizing the value of proprietary data bases, will increase subscription and royalty revenues over the forecast period. An accelerated growth rate (26%) will be due, among other factors, to:

  - Replacement of printed service with on-line data base services.

  - Automation of source data gathering and consumer markets.

  - Ability of data base vendors to bundle data base subscription fees with a package of services.

  - Price increases to offset revenue loss from printed publications.

  - Price increase due to a greater recognition of the inherent value of specialized data bases.

- On-line data base services are used in virtually all 13 industry sectors. Exhibit III-7 presents data on seven of the most important sectors in terms of user expenditures.


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EXHIBIT III-6

FORECAST OF USER EXPENDITURES FOR
ON-LINE DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR* 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 260 | $ 320 | $1,020 | 26% |
| REMOTE COMPUTING SERVICES VENDORS | 890 | 1,090 | 3,180 | 24 |
| DISTRIBUTION VENDORS | 20 | 30 | 80 | 26 |
| TOTAL | $1,170 | $1,440 | $4,280 | 24% |

*AAGR = AVERAGE ANNUAL GROWTH RATE


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EXHIBIT III-7

FORECAST OF USER EXPENDITURES FOR
ON-LINE DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| MARKET SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $ 270 | $ 330 | $ 870 | 22% |
| MANUFACTURING | 200 | 260 | 900 | 28 |
| SERVICES | 180 | 230 | 800 | 27 |
| RETAIL | 130 | 160 | 500 | 25 |
| TRANSPORTATION | 50 | 60 | 210 | 27 |
| GOVERNMENT | 50 | 60 | 140 | 19 |
| ALL OTHERS | 290 | 340 | 860 | 20 |
| TOTAL | $1,170 | $1,440 | $4,280 | 24% |


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- Banking and finance is currently the leading sector, with $270 million annual 1979 expenditures.

- Manufacturing (which includes both the process and discrete manufacturing sectors), with a greater growth rate (28%) and annual expenditures forecast at $900 million, will overtake banking and finance by 1985.

- The top four sectors - banking, manufacturing, services and retail - constitute nearly 70% of the total marketplace.

- High growth in the service and retail sectors is directly related to data bases containing consumer data.

- Additional information concerning on-line data base services supporting each market sector is found in Chapter IV, Market Analysis By Data Base Subsector.

## C. INFLUENCING FACTORS

### 1. TECHNOLOGY

- As shown in Exhibit III-8, a number of advanced technologies are coming together, which by the mid-1980s will cause explosive growth in on-line data base markets.

- Advanced distribution networks, data-oriented, are expected to provide high-volume data and facsimile transmission at greatly reduced costs.

  - A recent landmark FCC ruling opens up the door for AT&T to offer RCS.

  - Xerox has XTEN, a wideband data communication distribution system under development.


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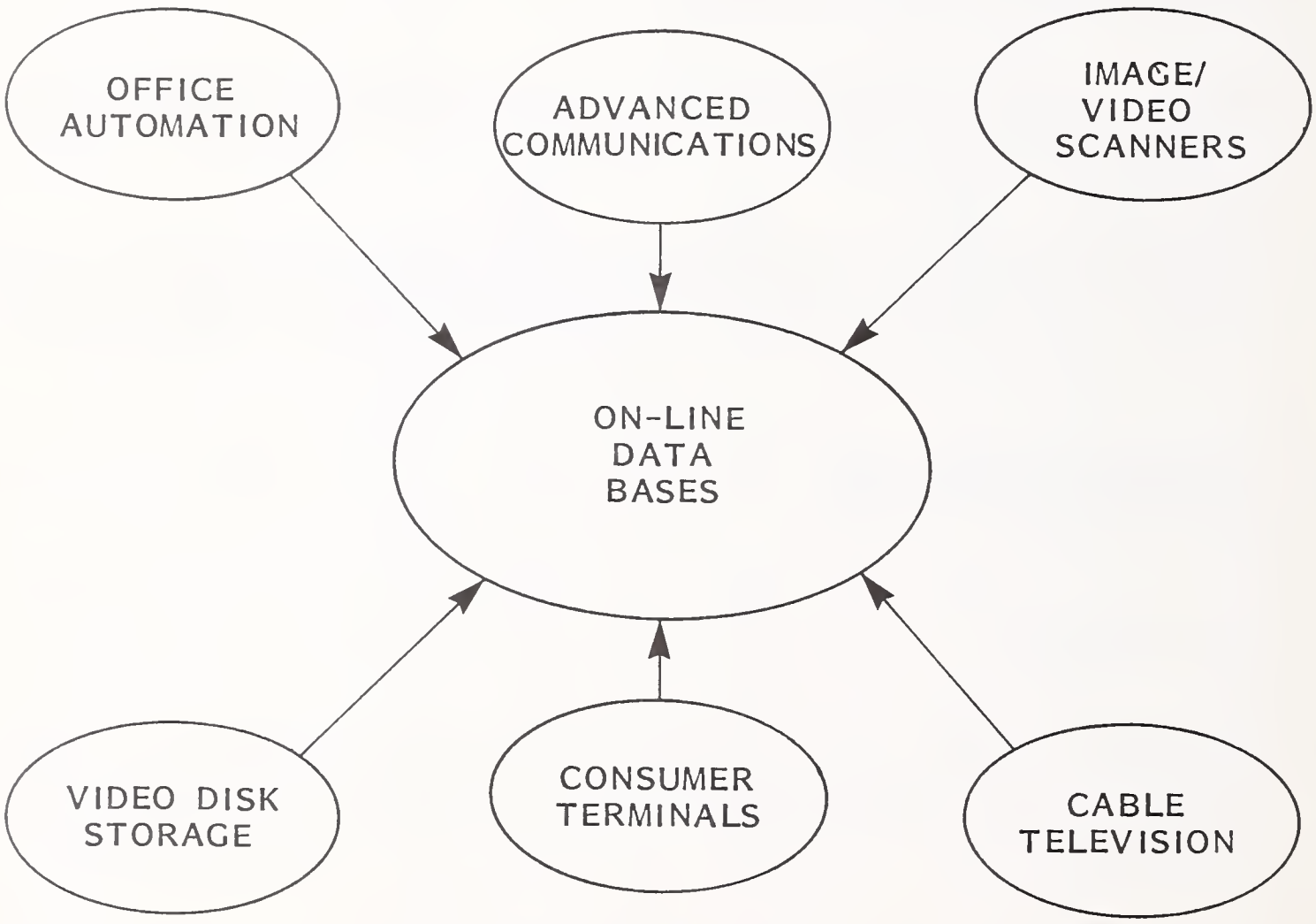
EXHIBIT III-8

ADVANCED TECHNOLOGIES RELATED TO
ON-LINE DATA BASE SYSTEMS





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- COMSAT/IBM/AETNA SBS will begin operation by 1981.

- Both Tymshare's TYMNET and GTE's Telenet are being upgraded, and services are being extended to up to 250 cities.

- Image handling systems, such as data scanners and video imaging systems, are expected both to reduce data capture cost significantly and to expand types of information contained in data bases.

- Cable television, a key to wideband data distribution to the consumer marketplace that is rapidly expanding in major cities, will be used for offering consumers and commercial establishments on-line data base services.

- Vendors have developments underway that will result in a cost breakthrough (less than $100) in offering consumer terminals integrating interactive keyboards with home television sets. Among these are:

  - Tandy Corporation's TV/Phone terminals.

  - Intelligent Systems Corporation's terminals for corporate in-house "Viewdata" systems.

  - The French PTT-sponsored Teledata interactive video display terminal developments.

  - The British Post Office's Prestel system TV/phone terminal developments.

- The development of mini/microcomputer-controlled office automation (including word processing) systems increases both the availability of on-line terminals for accessing data bases and the ability to capture data base information as a by-product of normal daily business operation.


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- The continued decline in storage costs strongly favors the economies of on-line data base services (including full-text) over that of more labor- and energy-intensive delivery systems, such as the printed publication. Disk storage costs announced by IBM, as shown in Exhibit III-9, reflect an average annual decrease in mass storage costs exceeding 30% for the 16-year period of 1964-1980.

- Videodisk technology, being developed jointly by IBM and MCA as well as home entertainment and communications vendors, promises even greater data storage economies coupled with new distribution possibilities, such as selective dissemination of data base information on a distributed basis to both corporate users and consumers. Projected videodisk storage costs, assessed in INPUT's Vendor Watch report "Image Processing Systems - Concepts and Status," are shown in Exhibit III-10.

2. COMPETITION

- Looking at consumer markets that could well exceed $10 billion by the late 1980s, newspapers, publishing and communications companies are expanding in the marketplace for on-line data base systems.

  - Dow Jones, accelerating its Dow Jones News/Retrieval Services in the corporate marketplace, is testing new services that will be offered directly to consumers.

  - Knight Ridder Newspapers, Inc. is testing an on-line information base system for consumers in Florida.

- Foreign-based vendors are expanding coverage to the U.S. marketplace.

  - Reuthers expanded the Monitor to the U.S. corporate marketplace, offering financial information from over 600 contributors, and trading in international money markets.


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EXHIBIT III-9

IBM DISK STORAGE COST PER BIT
AT DATE OF ANNOUNCEMENT

| ANNOUNCEMENT DATE | TYPE | MODEL | COST (¢ PER BIT) |
|---|---|---|---|
| 1964 | 2311 | - | .04 |
| 1965 | 2314 | - | .0096 |
| 1970 | 3330 | SD | .0033 |
| 1973 | 3340 | - | .0036 |
| 1973 | 3330 | DD | .0024 |
| 1975 | 3344 | - | .0011 |
| 1975 | 3350 | - | .00097 |
| 1979 | 3370 | A1 | .00077 |
| 1979 | 3370 | B1 | .00051 |
| 1980 | 3375 | A1 | .00071 |
| 1980 | 3375 | B2 | .00047 |
| 1980 | 3380 | A4 | .00048 |
| 1980 | 3380 | A4F | .00064 |
| 1980 | 3380 | AA4 | .00055 |
| 1980 | 3380 | AAF | .00071 |
| 1980 | 3380 | B4 | .00040 |
| 1980 | 3380 | B4F | .00055 |


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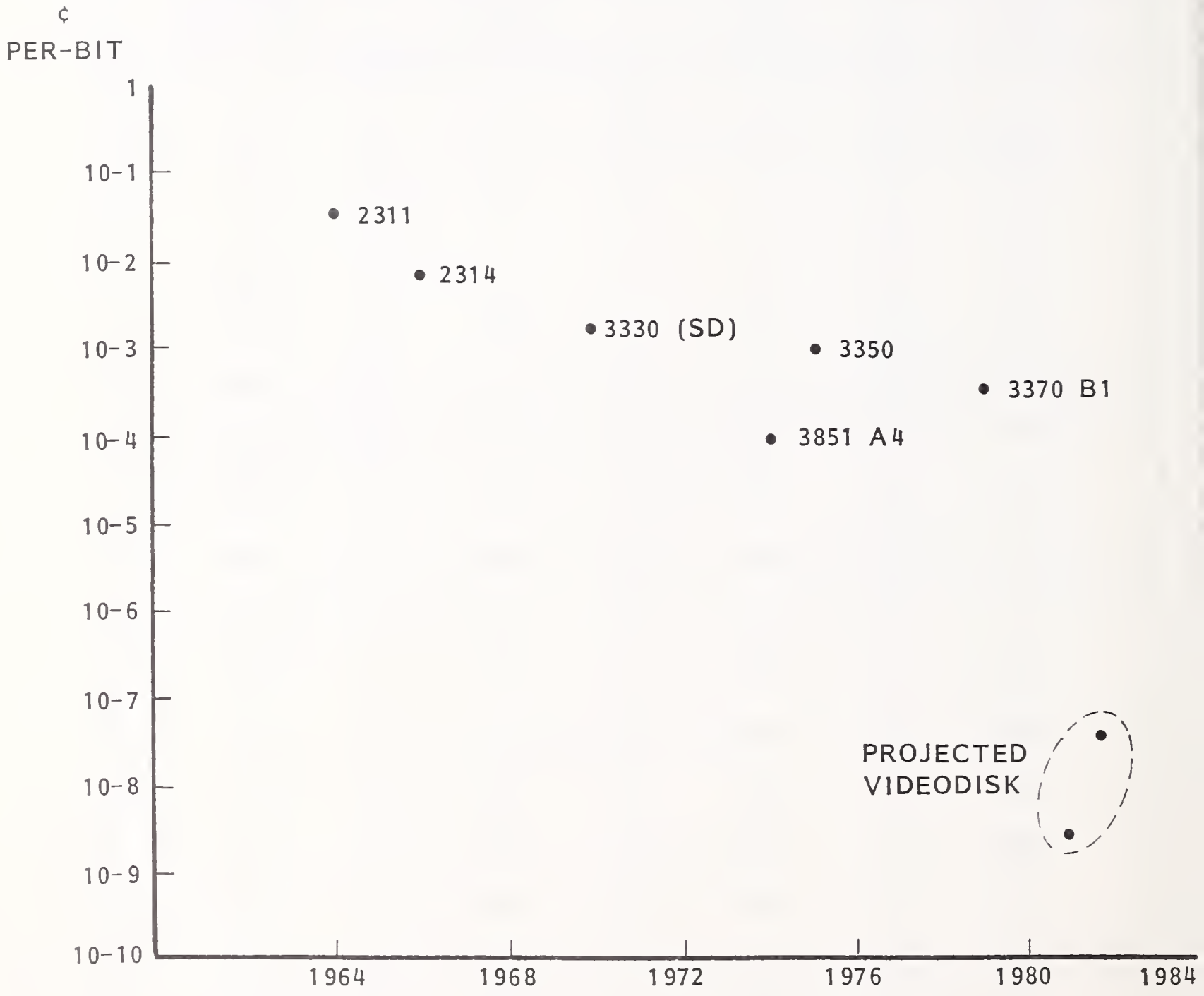
EXHIBIT III-10

ON-LINE STORAGE COSTS





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- IRS (European Space Agency) data base offerings are now available through international telecommunications networks.

- Vertical market integration is beginning to take place as major publishing houses prepare to take advantage of advanced electronic technology.

  - As shown in Exhibit III-11, Dun and Bradstreet, with the acquisition of NCSS, and McGraw-Hill, with DRI, have achieved vertical integration in the on-line data base services marketplace.

  - Ziff-Davis Publishing Company, with its recent acquisitions of Wharton Econometric Forecasting Associates, Inc. and Information Access Corporation, also appears headed towards the development of integrated electronic information delivery systems.

- General Telephone and Electronics has both the hardware and systems capability to cover all aspects of on-line data base services, as shown in Exhibit III-12.

  - GTE has acquired exclusive marketing rights to Prestel's Viewdata system development in the U.S.

  - The acquisition and expansion of TELENET adds to GTE's telephone network's capability in both the corporate and consumer marketplace.

  - GTE has consumer TV terminal development capability through Sylvania.

  - GTE Information Systems, Inc. (GTE/IS) has proven software, terminal and host processors for offering on-line data base services.


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EXHIBIT III-11

VERTICAL INTEGRATION IN ON-LINE DATA BASE SERVICES MARKETS
BY PUBLISHING FIRMS

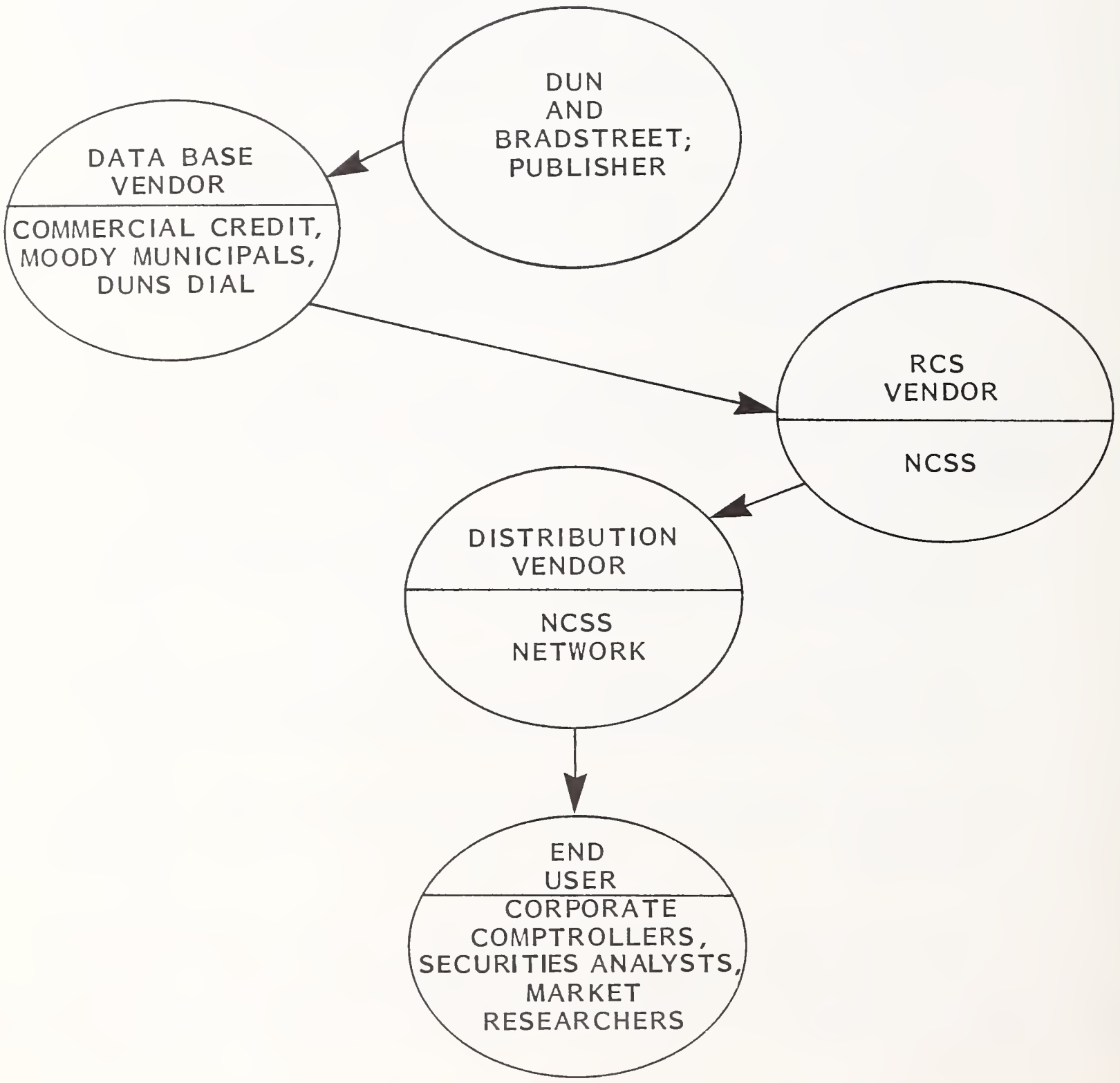



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EXHIBIT II-11 (CONT.)

VERTICAL INTEGRATION IN ON-LINE DATA BASE SERVICES MARKETS
BY PUBLISHING FIRMS

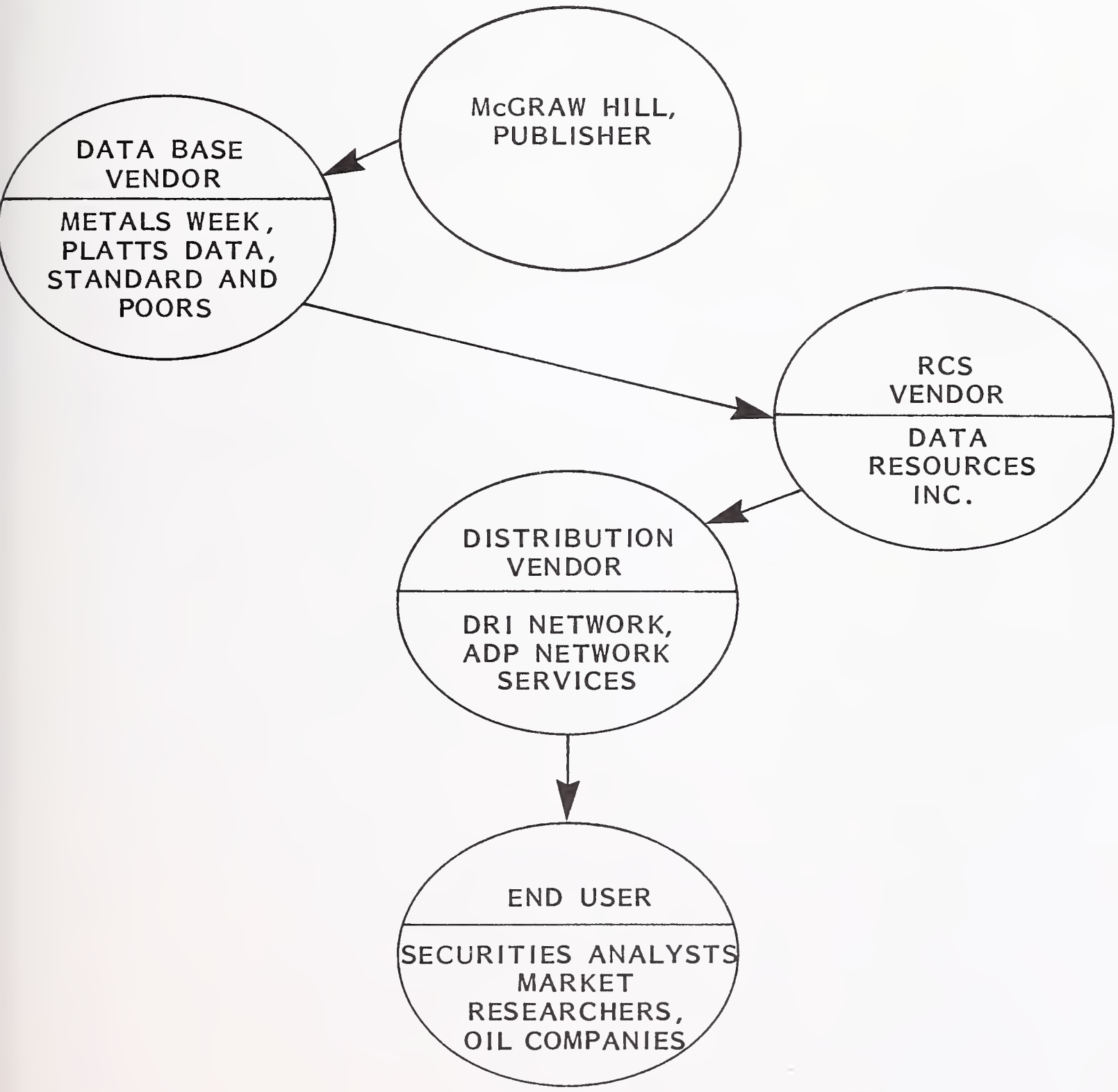



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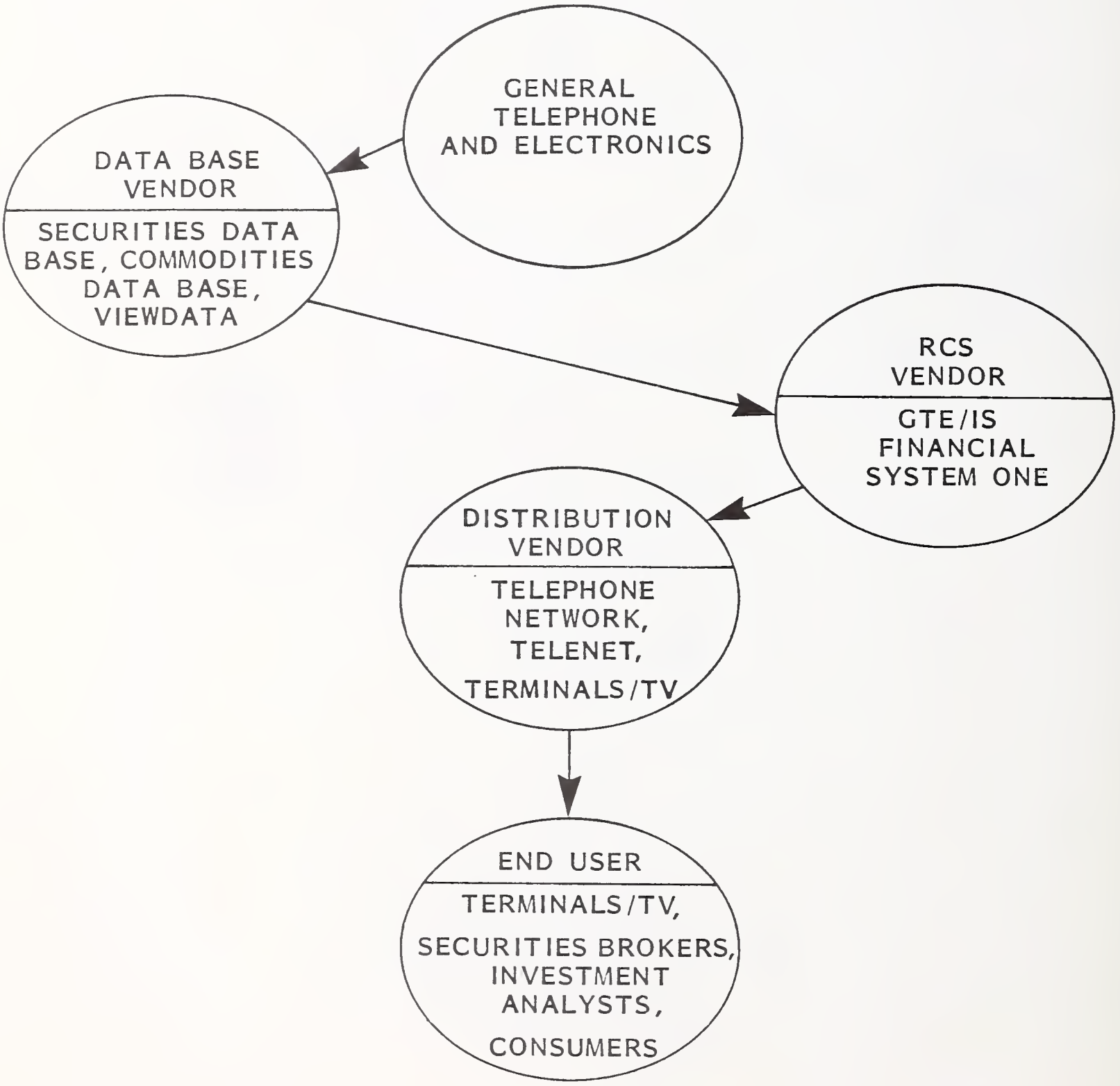
EXHIBIT III-12

VERTICAL INTEGRATION IN ON-LINE DATA BASE SERVICES MARKETS
BY COMMUNICATIONS VENDORS





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# IV MARKET ANALYSIS BY DATA BASE SUBSECTOR

# IV MARKET ANALYSIS BY DATA BASE SUBSECTOR

## A. ECONOMETRIC

### 1. TYPES

- Econometric data bases contain data, primarily economic or financial in nature, stored in time series in frequencies ranging from weekly through annually. The data bases contain aggregate (e.g., entire U.S., regional or sector) as opposed to micro (e.g., company assets, stock price) data.

- There are two types of data bases:

  - Historical data bases, where data is collected, at times adjusted, and validated over a significant time period of at least ten years.

  - Forecast data bases, containing data estimated by vendors' forecasting models for future time periods ranging from one week through one year for up to two years (short range) and annually up to ten years (long range).

- Vendor services combine consulting services with printed forecasts, economic reports, access to historical and forecast data bases, forecasting models and model-building software.


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- Resource, industry and international econometric data bases are covered in other sections of this chapter.

- Econometric data base services are used throughout the top 50 commercial banks:

  - Chief economists for forecasting interest rates and the economy.

  - Trust department analysts for portfolio analysis.

  - Investment Management Corporation analysts for fund management.

  - Treasury Department analysts for cash requirements forecasting.

- Corporate economists and management scientists in Fortune 500 companies use econometric data base services:

  - Economists for industry and U.S. economy forecasts.

  - Management scientists for strategic planning.

  - Directors of Planning for corporate planning.

  - Financial vice presidents for financial planning.

  - Treasurer financial analysts for portfolio management.

  - Market research analysts for industry and product analysis.

- The vice president or chief economist at very large (top 20) Savings and Loan Associations (S&L.s) use econometric data base services for forecasting savings flows, money market rates and the U.S. housing industry.


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- Econometricians in Treasury and Finance departments of large (110) insurance companies use econometric on-line data base services for cash requirements forecasting, investment decisions, and portfolio analysis.

- Institutional investors use econometric on-line data base services for interest rate and money market forecasting, fund analysis and management, and hedging.

2. MARKET FORECAST

- In the absence of improved accuracy in economic forecasting, the market for econometric data base services, currently growing at a 23% AAGR, will level off to a 20% AAGR for the forecast period.

  - Annual expenditures, currently approaching $70 million, will rise to $200 million in 1985, as shown in Exhibit IV-1.

  - Sustained growth will still come from the continued shift from printed report to on-line data base access.

- Revenue growth from econometric data base subscription services will fall as users turn away from vendor-supplied forecasts in favor of user-developed forecasts using vendor-supplied models and modelling software.

- Financial institutions (commercial banks, savings and loans, and money managers) are the largest users, making up 45% of the market, as shown in Exhibit IV-2.

- Corporate financial departments of Fortune 500 companies are an important (25%) but currently limited growth area.

  - Over 50% of Fortune 300 companies currently use econometric on-line data base services.


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EXHIBIT IV-1

FORECAST OF USER EXPENDITURES FOR
ECONOMETRIC ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $35 | $42 | $ 95 | 18% |
| REMOTE COMPUTING SERVICES VENDORS | 32 | 38 | 105 | 22 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $67 | $80 | $200 | 20% |


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EXHIBIT IV-2

FORECAST OF USER EXPENDITURES FOR
ECONOMETRIC ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $30 | $35 | $ 98 | 22% |
| INSURANCE | 8 | 10 | 21 | 18 |
| MANUFACTURING | 17 | 20 | 50 | 20 |
| GOVERNMENT | 4 | 5 | 10 | 18 |
| ALL OTHERS | 8 | 10 | 21 | 18 |
| TOTAL | $67 | $80 | $200 | 20% |


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- Many of the top 100 corporations use multiple vendors.

- Successful penetration to Fortune 1,000 companies has been slow due in part to the inability of econometric models to forecast accurately rapidly changing economic conditions brought on by inflation and political uncertainty.

3. KEY DATA BASES

- Data Resources, Inc. (DRI), the leading econometric data base vendor and also a diversified RCS vendor, offers five data bases used for U.S. aggregate econometric forecasting. Most data bases are created and maintained in time series by DRI from government data both automated on tape and by original entry. A few data bases are obtained in automated form from commercial data base vendors.

  - U.S. Central data base contains financial, economic and demographic time series dealing with the U.S. economy. Time series are available in frequencies from weekly to annually.

  - U.S. Model Data Bank contains 1,100 quarterly time series used with the DRI model of the U.S. economy.

  - U.S. Prices Data Bank contains over 17,000 time series on consumer, producer and industry sector prices.

  - U.S. regional data bases contain 42,000 time series on regional economic indicators.

  - DRI Capsule data base contains 3,700 time series on major U.S. economic indicators. The time series are those formerly maintained by the National Bureau of Economic Research.

- The Conference Board maintains a data base of 800 aggregate economic time series divided into 15 major categories, including such items as discretionary


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spending, capital spending, business executive expectations and financial indicators.

- Chase Econometric Associates, Inc. (CEAI) maintains four econometric data bases:

  - Financial data base, containing over 5,500 time series on key financial indicators of the U.S. economy.

  - Financial Forecast data base, containing 150 time series forecasted monthly for two years.

  - U.S. Economic data base, containing over 10,000 time series of macroeconomic data on the U.S. economy.

  - U.S. Macroeconomic Forecast data base, containing 600 time series forecast ten quarters (short range) and ten years (long range) into the future.

- Wharton Econometric Forecasting Associates (WEFA) maintains econometric data bases similar to those of CEAI and DRI.

- Merrill Lynch Economics maintains econometric data bases similar to but less extensive than those of CEAI.

- Citibank maintains CITIBASE, the National Bureau of Economic Research (NBER) data base of 4,000 time series on the U.S. economy. The data base, a standard offering for business analysis, is available through over 15 RCS vendors.

4. KEY VENDOR SERVICES

- An essential ingredient in offering econometric data base services is the national reputation of the head economist:


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- Otto Eckstein at DRI.

- Lawrence Chimerine of Chase Econometrics.

- Lawrence Klein at Wharton Econometric Forecasting Associates.

- Michael Evans in a new joint venture with SBC.

- Albert H. Cox at Merrill Lynch Economics.

- Alan Greenspan at Townsend-Greenspan, Inc., in a new joint venture with ADP.

- Econometric data base services vendors offer an array of econometric models, forecasts based on the models, and on-line use of the models by clients to produce individual forecasts.

- WEFA, with $5 million in 1979 revenues, offers two forecasting models using UNI-COLL INC. (Joint venture between University of Pennsylvania and Drexel Institute). Over 100 of WEFA's 250 clients access the models through TYMNET.

  - A short-range model forecasts the U.S. economy quarterly for up to 12 quarters for such items as national accounts, wages, prices, interest rates and flow of funds.

  - A long-range model forecasts the U.S. economy annually for ten or more years.

- CEAI, with 1979 revenues approaching $10 million, offers two forecasting models. Over half of Chase's 600 clients access the models through Interactive Data Corporation (IDC).


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- A macroeconomic model, forecasting the U.S. economy, produces quarterly output on 100 items for up to ten quarters.

- An interest rate model forecasts U.S. interest rates for over 50 items such as short-term instruments, commercial paper and prime rates, monthly, for 13 months.

- DRI offers a macroeconomic model of the U.S. economy to the major portion of its 550 clients through its own RCS network. 1979 revenues for econometric services related to the U.S. economy are estimated at $20 million.

  - The model forecasts 900 variables, monthly up to 12 quarters, and then quarterly for the succeeding ten years.

- Merrill Lynch Economics offers its U.S. Macroeconomic Model together with forecast data bases through NCSS.

  - The model forecasts over 1,000 economic and industry indicators.

  - The short-term forecast data base is quarterly for 12 quarters.

  - The long-term forecast data base is annually for up to 20 years.

- Townsend-Greenspan, Inc., in a joint venture with ADP; Evans Economics, in a joint venture with SBC; and UCLA Business Forecasting Project through GEISCO, all offer similar econometric data base services to those of the above four vendors.

## B. SECURITIES AND COMMODITIES

### 1. TYPES

- Securities and commodities data bases, real-time in nature, are associated with securities, commodities and money market trading. Whereas some of the


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data contained in the data base may be historic, the major part of the value added is in the timeliness of the data. The majority of the data result from trading information coming from the various stock and commodity exchanges and money market operations.

- The data base services offered are inquiry in nature. Trades are currently accomplished through existing execution systems.

- Three types of data bases exist:

  - Data bases associated with the primary securities and commodities exchanges.

  - Data bases associated with secondary markets.

  - Financial news data bases.

- Data bases supporting major exchange trading activities come directly from the floor of the exchanges through data base producers such as the Associated Press or Telstat. The data come automated, primarily in electronic form. The data are integrated into the data base of a services vendor such as Quotron Systems for display via CRT terminals to the end user.

- Data bases involved in secondary market operations are maintained by a services offerer such as Autex, from data input on-line by securities specialists. The offerings are communicated by the services vendor to prospective buyers such as institutional investors, bypassing the major exchanges.

- Financial news data bases, supplied by wire services, contain textual information both current and historic. Data bases such as Dow Jones News are offered both directly and through services vendors such as Bunker Ramo.


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## 2. MARKET FORECAST

- With over 66,000 installed terminals in a mature market, securities and commodities data base services, $140 million in revenues in 1979, will experience only moderate growth (14% AAGR), reaching $300 million in 1985, as shown in Exhibit IV-3.

- Expanded offerings of financial news data base services such as Reuthers in international financial markets will accelerate revenue growth for data base vendors.

- Revenue growth for remote computer services vendors, currently at 8% AAGR, will also increase due to both additional terminal services, such as the ability of a broker to switch through a branch microcommunications processor from quotation to execution services, and the trend toward assigning an individual teminal to each broker.

- As shown in Exhibit IV-4, the banking and finance sector is the major (70%) market area.

  - Eighty-five percent of total expenditures are by brokerage houses.

  - Fifteen percent of total expenditures are from banks and institutional investors.

- The market for securities and commodities on-line data base services will increase through integration of quotation and execution as a National Market system is evolved, electronically linking all stock and commodity exchanges.

## 3. KEY DATA BASES

- Quotron Systems maintains a data base of current price quotations, dividends, earnings, forecasted earnings reports, popular market statistics, market indices, and historical and other security trading data. Data come directly


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EXHIBIT IV-3

FORECAST OF USER EXPENDITURES FOR SECURITIES AND COMMODITIES ON-LINE DATA BASE SERVICES BY VENDOR TYPE, 1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 30 | $ 35 | $ 80 | 18% |
| REMOTE COMPUTING SERVICES VENDORS | 110 | 120 | 220 | 12 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $140 | $155 | $300 | 14% |


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EXHIBIT IV-4

FORECAST OF USER EXPENDITURES FOR
SECURITIES AND COMMODITIES ON-LINE DATA BASE SERVICES BY
INDUSTRY SECTOR, 1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $100 | $111 | $225 | 15% |
| INSURANCE | 13 | 14 | 23 | 12 |
| GOVERNMENT | 7 | 8 | 12 | 12 |
| ALL OTHERS | 20 | 22 | 40 | 12 |
| TOTAL | $140 | $155 | $300 | 14% |



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from the major exchanges and other financial information sources. The data base contains real-time and historical data on stock, bond, options and commodity prices. Similar data bases are maintained by Bunker Ramo and GTE/IS.

- Dow Jones maintains a financial news data base. The data base contains the last 90 days' financial news stories from the Wall Street Journal, Barron's and the Dow Jones News Service. Access is possible by stock symbol for some 6,000 companies as well as by major subject categories. The data base also contains price information on 6,000 company financial stocks and bonds, as well as prices on major money market instruments.

- Bunker Ramo maintains a data base on current price quotations, dividends, popular market statistics, and historical and other security trading data for over-the-counter securities. The information is supplied by participating members of the National Association of Securities Dealers. The data base is used by some 2,000 dealers using the NASDAQ system.

- Autex Systems maintains a data base of offerings to buy and sell blocks of 10,000 or more shares of stock in the institutional marketplace. The data base is used by over 400 brokers and institutions.

- Monchik-Weber maintains a data base of options and their underlying values. The data base is available on-line to some 400 traders, brokers, and investment managers.

- Remote Computing Corporation (RCC) maintains a data base of offerings in the secondary mortgage market. The data base contains mortgage loan package offerings, FHLMC auction results, C.D.s, bankers' acceptances, GNMAs, and treasury and agency issues. The data base is offered through the Mortgage Index System (formerly AMMINET) to over 150 S&Ls, mortgage brokers and investment managers.


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## 4. KEY VENDOR SERVICES

- The Bond Buyer recently instituted a data base service offering GMNA mortgage pool information on-line to some 300 dealers. The data base service is offered both through SBC and directly (using Telenet). On-line service will be shifted to the private network of Inconet Corporation, a recent Bond Buyer acquisition.

- Secondary mortgage market trading using the Mortgage Index can be executed through an RCC venture with B. J. Dillon Company.

- Autex has initiated data base-oriented trading systems in three additional areas:

  - Used capital machine equipment.

  - Coins.

  - Stamps.

- Telerate Systems, Inc. offers a financial news data base service to over 2,000 on-line subscribers. The data base is accessed through "pages," some of which contain data compiled by Telerate, while others are supplied by vendors such as Money Market Services, Inc. Vendors lease "pages" from Telerate and collect access fees from subscribers.

- Quotron Systems, with a comprehensive market montage of prices and activity for securities listed on all exchanges, and with the capability to access traders at exchanges from brokers' terminals for direct execution, is positioning itself for greater opportunities in the evolving National Market.

- GTE/IS is in the process of converting its financial information services network to its recently acquired Telenet System, permitting the Financial System One to operate in an improved data communications environment.


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Availability of an expanded Telenet network will also enable GTE/IS to interconnect to other services, to reach individual investors, and to compete better in the national market.

## C. FINANCIAL AND ECONOMIC

### 1. TYPES

- Financial and economic data bases contain historic data. The data may be aggregate economic information about financial and real markets (e.g., production, sales) or data about individual companies or financial instruments (e.g., stocks, bonds).

- Financial and economic data bases differ from securities and commodities data bases discussed in Section B in that the data are not maintained in real (or near-real) time.

- Financial and economic data bases differ from econometric data bases in that the former do not contain forecasted data.

  - Overlap exists between financial and economic data bases and some econometric data bases containing historical data.

- Financial and economic data bases fall into five types:

  - Financial market data bases, containing money market information such as interest rates on treasury bills or commercial paper.

  - Financial institutions data bases, containing financial and economic data about banks, savings and loans, and other financial institutions.


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- Stock and bond data bases, containing historical, financial and economic data on stocks and bonds.

- Commodities data bases, containing historical, financial and economic data on commodities such as agricultural products, metals, oil, currency, futures and mortgage instruments.

- Corporation data bases, containing financial data about corporations and economic data about industries.

## 2. MARKET FORECAST

- The market for financial and economic data base services, more widely based than that for econometric data base services, with over $100 million in 1979 revenues, will approach $0.5 billion in 1985, as shown in Exhibit IV-5.

  - Data base producers, offering both greater variety of data bases and ever more sophisticated access and analysis software, will, with a 30% AAGR, garner a greater market share.

- Favorable market growth has been due to the following factors:

  - More MBAs, university-trained in computer-oriented analysis and planning, are becoming corporate end users.

  - Vendors have made the human/machine interface more friendly through improved access (DBMS) and analysis software.

  - Uncertainty in financial markets has forced corporations to increase their emphasis on financial and corporate planning.


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EXHIBIT IV-5

FORECAST OF USER EXPENDITURES FOR
FINANCIAL AND ECONOMIC ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 15 | $ 20 | $ 70 | 30% |
| REMOTE COMPUTING SERVICES VENDORS | 110 | 140 | 380 | 23 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $125 | $160 | $450 | 24% |


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- RCS vendors uniformly report significant "pull-through" revenues through offering financial and economic data base services. Average "pull-through" revenue as reported by vendors was $8 in timesharing revenues for every $1 in data base subscription revenues in this subsector.

- Financial and economic data base services are widely used by all industry sectors. Of the five primary sectors shown in Exhibit IV-6, the banking and finance sector is the most important, encompassing 48% of total 1979 expenditures.

3. KEY DATA BASES

- The study identified well over 30 financial and economic data base offerings. The data bases outlined below illustrate many of the key ones.

- Financial markets:

  - The Federal Reserve Bank of San Francisco (FRBSF) maintains a data base containing over 3,800 financial time series. The data base contains such items as interest rates on money market instruments and key information on the money supply.

  - Telerate Systems, Inc. maintains a financial data base on money markets. The data base contains over 10,000 time series covering primarily U.S. financial instruments. Data items include money market rates such as federal funds, treasury bills and certificates of deposit, quotations on GMNA certificates, currency exchange rates, commercial paper, treasury balances, and savings and loan funds.

  - Bank of America maintains a financial data base containing current and historical statistics on money market rates primarily for U.S. instruments. The data base contains over 2,400 time series on money and credit items, such as interest rates, prices and yields on treasury securities, foreign exchange rates, operating statistics on financial markets and Federal Reserve Fund flows.


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EXHIBIT IV-6

FORECAST OF USER EXPENDITURES FOR
FINANCIAL AND ECONOMIC ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $ 60 | $ 80 | $240 | 26% |
| INSURANCE | 10 | 12 | 30 | 20 |
| PROCESS MANUFACTURING | 12 | 16 | 42 | 23 |
| DISCRETE MANUFACTURING | 18 | 22 | 63 | 23 |
| GOVERNMENT | 15 | 18 | 45 | 20 |
| ALL OTHERS | 10 | 12 | 30 | 22 |
| TOTAL | $125 | $160 | $450 | 24% |


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- Financial institutions:

  - Cates Lyons and Co. maintains a historical data base of over 800 key financial data items on 250 major banks and bank holding companies.

  - Robinson-Humphrey Company maintains a data base of key financial items on 145 top bank holding companies. The data base is offered together with comparative analysis software.

  - SBC maintains a financial institutions data base of financial information containing:

    . FDIC data on over 14,000 commercial banks.

    . FHLB data on over 4,500 savings and loans.

    . NCUA data on over 16,500 credit unions.

  - Payment Systems, Inc. offers a data base through IDC containing statistics on major aspects of financial transaction systems, including ACH, ATM, credit cards, NOW and share draft accounts, and telephone bill paying systems. The data base also includes key money market indices and market attitudes data on both electronic and paper payment systems.

- Stocks and bonds:

  - Blyth Eastman Dillon & Co. maintains a financial data base that contains daily price and yield information on over 800 bonds and other money market instruments including U.S. Treasury notes.

  - IDC maintains probably the most comprehensive data base system on securities markets:


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. Security Master data base, containing financial data on over 45,000 U.S. and Canadian securities.

. Prices data base, containing time series on daily price and volume data for over 12,000 major securities.

. Masterprice data base, containing time series of weekly bid prices for over 15,000 unlisted corporate bonds, and 7,000 over-the-counter stocks.

. Municipal Bond data base, containing time series of daily valuation for more than 1.7 million municipal bonds.

. Split and Dividend data base, containing daily time series of stock splits and stock and cash dividends for over 12,000 major securities, and 100 securities market indices.

. Monthly/Quarterly data base, containing time series of earnings per share, outstanding and short interest for over 6,500 listed companies, and 100 securities market indices.

- Securities Data Company maintains a data base of 2,200 debt securities. The data base includes such items as face value, maturity, call provisions and selected ratios.

- DRI maintains a securities data base containing current and historical data on such items as fundamental information, price and dividends on over 30,000 stocks and 18,000 bonds.

- Frederick C. Towers and Company maintains a data base containing financial data on over 31,000 primarily U.S. and Canadian publicly traded securities. The data base, containing such data items as bid prices, dividends, ratings, earning, and bond coupon and yield values, is offered with VALPORT Software for estate planning and portfolio evaluation.


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- Merrill Lynch Economics maintains a data base containing price and yield information on over 18,000 corporate utility and municipal bonds.

- Telstat Systems, Inc., the major supplier of financial data bases to RCS vendors, maintains a comprehensive data base system for financial markets.

  . Teleprice/80 data base contains over 50 financial items on over 30,000 securities.

  . Municipal bonds data base contains data items such as price, yield, pricing to call on maturity and monthly price evaluations for over 1.5 million bonds.

• Commodities:

- CISCOM, Inc. offers a historical data base containing daily open, high, low and closing prices on actively tracked commodity futures contracts through GEISCO.

- CALL Computer, Inc. maintains a historical data base containing daily Dow Jones futures quotes on agricultural commodities, metals, currency, mortgages and U.S. treasury bills.

- DRI offers a historical commodity data base containing 17,000 daily futures prices on commodities contracts in the U.S. and Canada.

- MJK Associates maintains a data base containing current and historical time series of financial information for all active commodity contracts in 36 major commodity groups traded on seven major commodity exchanges.

- Commodity Information Services Company (CISCO) maintains a commodity futures data base containing daily time series on


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commodity, interest rate, government securities and international money market futures on all major U.S. and London exchanges.

- Corporation:

  - Standard and Poors maintains the COMPUSTAT data base of financial information on over 6,000 corporations and institutions listed on the major U.S. and Canadian exchanges and sold over the counter. The data base is used on-line by over 200 users through six RCS vendors.

  - DRI maintains an industry financial data base containing annual time series of financial balance sheet items for 81 industries and over 600 major companies.

  - Lynch, Jones and Ryan maintains a data base of earnings per share statistics for 2,200 companies. Earning estimates are provided for each company by up to 50 institutional brokers.

  - Arnold Bernhard and Co. maintains the Value Line corporate financial data base containing over 400,000 time series on over 1,600 major U.S. companies and institutions. The data base, offered by six RCS vendors, contains over 100 items of information estimated and obtained from company quarterly and annual financial statements.

  - Standard and Poors maintains a data base of industry financial data. The data base contains over 1,800 time series covering 100 industry groups. Data include such items as sales, earnings, taxes, profit, dividends, working capital and securities prices.

4. KEY VENDOR SERVICES

- ADP Network Services specializes in financial and economic data base services to both financial institutions and industrial corporations. These services include:


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- BANKCOMPARE, using the Cates Lyons Bank financial data base.

- Business cycle analysis services, using the U.S. Commerce Department data base on 750 leading business indicators.

- Bond analysis, using the Blyth Eastman and Dillon bond analysis system.

- Merger/acquisition analysis, using the COMPUSTAT data base.

- Financial analysis, using the Security Data Company data base on 2,200 debt issues.

- Portfolio analysis and pricing, using FASTOCK II, an ADP data base containing data on over 43,000 securities.

- BANCALL II, using the Federal Deposit Insurance Corporation (FDIC) data base on federally insured banks.

- Market analysis and planning, using the Federal Reserve Board (FRB) Flow of Funds data base of 4,000 time series on sources and uses of funds for 50 major economic sectors.

- Mortgage market analysis, using the FHLB data base on 4,500 savings and loans.

- Money Market Services Inc., developing financial and economic data bases to replace those of CEAI as the latter shifts its data base offerings from ADP to IDC, also provides some 400 subscribers with forecasts of major money market rates, a survey of money supply estimates based on the opinion of 60 major dealers, and an assessment of current Federal Reserve action, through the Telerate financial communications network.

- Interactive Data Corporation, supported by Chase Econometrics, specializes in economic and financial data base services to the banking and finance sector.


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- IDC has integrated access to its data base offerings through the XSIM data base access and financial modeling system.

- IDC offers:

  . Financial transactions, systems analysis and planning, using Payment Systems, Inc.'s data base.

  . Portfolio pricing and analysis services, using its comprehensive SECURITIES data base system.

  . Merger/acquisition analysis, using the COMPUSTAT data base.

  . Commercial bank performance analysis, using the FDIC data base.

  . Financial and economic analysis, using the FRB Flow of Funds data base.

  . Institutional analysis, using the Lynch, Jones and Ryan data base.

    Investment analysis, using the Value Line data base.

- IDC's revenues for financial and economic data base related services ($18 million in 1979) are expected to exhibit a growth rate consistent with the market average in 1980.

• Service Bureau Company (SBC), with 1979 revenues for financial and economic data base services exceeding $14 million, continues to expand offerings in this market segment using its PROPHIT II financial management and planning system. These offerings include:

- Comparative analysis of banking institutions, using the Robinson-Humphrey data base and speciality software.


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- Competitive corporate financial analysis, using the COMPUSTAT data base.

- Financial institutions market analysis, using the SBC Financial Institution data base.

- Investment analysis and portfolio pricing, using the Telstat Securities data base.

- Security and commodity options analysis, using the Monchik-Weber options history data base.

- Estate planning and portfolio analysis and valuation, using the VALPORT software with the Frederick C. Tower and Co. data base.

- GEISCO, an early leader in the use of financial and economic data bases with over $20 million in 1979 related revenues, concentrates offerings in the corporate marketplace. GEISCO uses FAL II to assist analysts in corporate financial and marketing planning. Key financial and economic data base services offerings are:

  - Acquisition/merger analysis, using the Value Line data base.

  - Hedging decision analysis, using the CISCOM commodity futures data base.

  - Investment planning and portfolio valuation, using the Telstat securities data base.

- Rapidata, with 1979 related revenues of nearly $12 million, offers financial and economic data base financial analysis and planning services using two software systems: FISCAL and Probe. Related key offerings include:


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- Financial analysis, using the FRBSF financial market data base.

- Marketing planning, using the Market Statistics data base, which contains retail sales and market statistics on over 3,100 U.S. counties and other areas.

- Management analysis and investment and planning, using the Telerate financial data base.

- Portfolio analysis and evaluation, using Rapidata's Rapidquote data base of Telstat securities data.

- Bond valuation, using Rapidata's Bond data base, which contains over 6,000 over-the-counter bond price data obtained from Telstat.

- DRI, long a leader in econometric data base services to Fortune 500 companies, has expanded its service offerings into the financial and economic data base marketplace. Its 1979 related revenues, exceeding $6 million, were derived from offering financial and economic data base services such as:

  - Company evaluation, using DRI's EMPIRE and the COMPUSTAT data base.

  - Profit/loss analysis, using the DRI Commodities Market Data Bank.

  - Financial market analysis, using the Bank of America Financial and Credit Statistics data base.

  - Portfolio analysis and investment planning, using the DRI Securities data base.

  - Competitive financial analysis, using DRI's financial Analysis System (FAS) and the Value Line data base.


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## D. DEMOGRAPHIC

### 1. TYPES

- Demographic data bases are numeric, containing data on households, family income, expenditures, housing, population, employment and education.

- Starting with the 1970 Census tapes, data base producers utilize secondary sources such as the Census' Current Population Survey, local and regional planning agencies, and estimation techniques to update and expand demographic data bases.

- Two types of demographic data bases are differentiated by the degree of data aggregation:

  - Data bases aggregated at the city, state, regional and national level used for general economic and market analysis and planning.

  - Data bases aggregated by Standard Metropolitan Statistical Area (SMSA), zip code, latitude/longitude, country, Areas of Dominant Influence (ADI), or Office Of Civil Defense centroids.

### 2. MARKET FORECAST

- User expenditures will rise by $100 million between 1979 and 1985, resulting in a 25% AAGR, as shown in Exhibit IV-7.

- Completion of the 1980 census will tilt the 1979/80 growth curve of 20% permanently upward.

  - The availability of two data sets (1979 and 1980) for each demographic area results in a geometric increase in possibilities for data analysis.


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EXHIBIT IV-7

FORECAST OF USER EXPENDITURES FOR
DEMOGRAPHIC ON-LINE DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 6 | $ 7 | $ 29 | 30% |
| REMOTE COMPUTING SERVICES VENDORS | 30 | 36 | 106 | 24 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $36 | $43 | $135 | 25% |


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- Data base vendors, recognizing the value of both the data and proprietary research and analysis software, will demand increased royalties for data base access and data analysis, resulting in a 30% AAGR.

- Demographic data base services are used in conjunction with a wide variety of corporate marketing, financial and distribution functions, resulting in high "pull-through" RCS revenues.

- The retail and services sectors together represent half of the marketplace for demographic on-line data base services, as shown in Exhibit IV-8.

  - Spurred by the availability of the 1980 census, user expenditure growth will also be largest in these sectors.

3. KEY DATA BASES

- Urban Decisions, Inc., one of the two major data base vendors, offers a comprehensive demographic data base containing 177 items, coupled with data base access and analysis software, through National CSS. The data base can be accessed by a wide variety of parameters such as zip code, SMSA, and latitude/longitude.

  - Ability to access the data base through the NOMAD DBMS enables the demographic data to be used for site selection as well as general economic analysis.

- CACI, Inc., the other major data base vendor, offers an expanded demographic data base containing 750 items of information aggregated at the detailed level. The data base and access software are offered through many RCS vendors, including ADP, CSC, DRI and GEISCO.

  - A specialized data base and software for determining retail sales potential is offered through SBC and United Computing Systems (UCS).


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EXHIBIT IV-8

FORECAST OF USER EXPENDITURES FOR
DEMOGRAPHIC ON-LINE DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $ 5 | $ 6 | $ 19 | 25% |
| RETAIL | 9 | 11 | 42 | 30 |
| SERVICES | 7 | 8 | 27 | 26 |
| UTILITIES | 3 | 4 | 11 | 24 |
| DISCRETE MANUFACTURING | 4 | 5 | 13 | 22 |
| ALL OTHERS | 8 | 9 | 23 | 20 |
| TOTAL | $36 | $43 | $135 | 25% |


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- Regional Data Associates offers a demographic data base containing over 20,000 time series, aggregated by the U.S., regions, states, and SMSAs through Interactive Data Corporation. Support software is oriented toward housing construction and financial markets.

- Data Resources, Inc. uses data from the U.S. Census Bureau's annual population surveys to create annual time series on demographics by the U.S. and four regions.

4. KEY VENDOR SERVICES

- Vendors have been highly successful in developing specialized software products to support demographic data base offerings. The proprietary software greatly adds to the value of the demographic data base offerings, resulting in higher revenue to both the data base vendor and the RCS vendor offering the service.

- By developing a data base on existing bank and S&L branch site locations in California and New York, Urban Decision Systems offers a specialized service to financial institutions and commercial real estate brokers for branch site location.

- Restructuring demographic data bases to be compatible with data base management systems has enabled end users to include demographics in corporate financial, marketing and distribution planning studies.

- Restructuring demographic data bases to match servicing areas geographically has enabled telephone companies and public power utilities to integrate demographic data base and consumer consumption data for load forecasting, rate structuring and service planning.

- Demographic data base services have become key in the areas of government assistance programs and political activity.


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- Demographic data base services are widely used in both political campaigning and in reapportionment processes.

- Well over 100 federal and state programs require demographic supporting data for funds allocation.

## E. RESOURCES

### 1. TYPES

- Resources data bases contain data on natural resources in the U.S. and Canada, offshore, and, to some extent, internationally.

- As a direct result of the energy crisis, resources data bases associated with oil, gas and coal have proliferated.

- The study identified two types of data bases:

  - Data bases containing data specific to resource location, such as well location, drilling costs, reserves and well production.

  - Data bases containing aggregate economic data, such as oil imports, gas production costs and coal consumption by state, stored as time series.

### 2. MARKET FORECAST

- Dealing in a market area where very high development and production costs are involved, vendors can demand high value added for needed resources data base services.

- Spurred by rapid price escalation resulting from increasing demand and scarcity in the marketplace, resources data base services, with less than $20


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million in revenues in 1979, will increase to nearly $100 million in 1985, a 35% AAGR, as shown in Exhibit IV-9.

- Data base vendors, devising new specialized data bases coupled with specialty software, will lead market growth with a 40% AAGR.

- The process manufacturing sector, with increasingly expensive energy exploration and development costs, is the major (50%) user of resources data base services, as shown in Exhibit IV-10.

- The federal government, continually involved in geopolitical and economic energy issues and also a major data base producer, is a user of resources data base services as well.

3. KEY DATA BASES

- The American Petroleum Institute (API), in conjunction with the federal Office of Oil Imports, maintains a data base, updated monthly, of all U.S. petroleum imports.

- Petroleum Information Corporation maintains a specialized data base of oil and gas well drilling history for the U.S., including offshore and Alaska.

- McGraw-Hill maintains two resources data bases:

  - Census of Coal Mines data base on U.S. and Canadian coal mines and production. The data base, updated semiannually, contains data on 1,500 companies and over 3,000 mines.

  - Platt's Data Bank, containing aggregate economic data in the form of time series on both domestic and foreign petroleum prices, both wholesale and retail.

- DRI maintains three resources data bases:


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EXHIBIT IV-9

FORECAST OF USER EXPENDITURES FOR
RESOURCES ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 4 | $ 6 | $30 | 40% |
| REMOTE COMPUTING SERVICES VENDORS | 12 | 16 | 66 | 33 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $16 | $22 | $96 | 35% |


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EXHIBIT IV-10

FORECAST OF USER EXPENDITURES FOR
RESOURCES ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| PROCESS MANUFACTURING | $ 8 | $11 | $60 | 40% |
| BANKING AND FINANCE | 3 | 4 | 14 | 30 |
| UTILITIES | 2 | 3 | 10 | 30 |
| GOVERNMENT | 2 | 2 | 8 | 25 |
| ALL OTHERS | 1 | 2 | 4 | 25 |
| TOTAL | $16 | $22 | $96 | 35% |


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- Coal Data Bank, containing data on coal production, distribution and consumption. Over 3,000 annual and monthly time series, aggregated by state and the U.S., including residential, industrial and commercial sector demand, and consumption by coal plant type.

- Drilling Data Bank, containing oil and gas exploration and development data. The data base contains 4,500 time series on such items as reserves, rigs, wells, drilling footage and drilling costs.

- Energy data base, containing aggregate economic data in 22,000 time series on sources and uses of all major energy resources. Data include such items as refining and electric utility operations, and consumption and cost information by major SIC code by state and for the U.S.

- CEAI maintains an aggregate economic energy data base of 26,000 time series on the supply and demand of energy resources including petroleum, gas, coal and electricity. Data include reserves, production, consumption, trade and prices.

- Computer Sciences Corporation (CSC) maintains three resources data bases.

  - Under contract with the U.S. Geological Survey, CSC maintains:

    . National Coal Resources data base, containing coal reserves, quantity and quality, by state.

    . Lease/Sale History data base, containing data on U.S. offshore oil leases, bids and sales.

    . Search data base, containing data for estimating costs to retrieve oil and gas offshore to the U.S., Canada, Alaska and England.

- The University of Oklahoma maintains two resources data bases:


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- Mineral data bank, containing 45,000 items of metallic and non-metallic mineral resources in the U.S. and internationally.

- Petroleum data banks, containing data on over 80,000 gas and oil fields in the U.S., offshore and in Canada.

- The federal Department of Energy maintains a data base of such items as raw energy stocks, refinery and pipeline operations, and stocks of finished products.

4. KEY VENDOR SERVICES

- CSC specializes in resources data base services for energy exploration and development. Its lease/sale and search services currently assist 12 major energy companies in formulating ventures for lease bids, area exploration and well development. Growth, currently at 25% in the initial year, is expected to double as efforts accelerate to decrease U.S. petroleum imports.

- GEISCO offers Petroleum Information Corporation's Drilling Activity Analysis Systems (DAAS) to 80 major oil and gas, and development and production companies. Data base services, oriented toward well drilling and production, are growing at an annual rate in excess of 35%.

  - Resources data base services are also offered for minerals.

- The Computer Company (TCC) offers resources data base services for petroleum imports, domestic production and consumption using data bases from the American Petroleum Institute (API) and the U.S. Department of Energy (DOE).

- The federal Department of Energy (DOE) offers resources data base services through the Federal Energy Data System (for which user expenditures are not covered in this study).


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- ADP currently offers resources data base services for coal and petroleum using McGraw-Hill data bases.

  - The acquisition of DRI by McGraw-Hill will affect ADP's offerings when the existing licensing agreements expire.

- DRI requires annual subscription fees of up to $40,000 for access to its three resources data bases and associated econometric models.

- CEAI requires a $2,000 annual subscription fee to access its Energy data base through IDC.

## F. INDUSTRY

### 1. TYPES

- Industry data bases contain data targeted to a specific industry, such as airlines, agriculture or steel. While at times containing some international data, industry data bases contain primarily information about U.S. industrial activity.

- Two types of data bases exist:

  - Data bases containing aggregate economic data, such as steel production, tonnage shipped by rail or compact car sales, stored as a time series.

  - Data bases containing data specific to an industry function, such as rail freight rates for small home appliances, fire insurance income for Fireman's Fund or ore-carrying ships over 10,000 tons.


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- Over 30 industry data bases were identified as falling into the following sectors:

  - Process manufacturing (4).
  - Insurance (4).
  - Transportation (15).
  - Discrete manufacturing (5).
  - Other (9).

2. MARKET FORECAST

- As shown in Exhibit IV-11, the market for industry data base services, with less than $40 million in revenues in 1979, will exceed $125 million in 1985, a 23% AAGR.

- End users, more interested in access to industry data bases for input to their company-developed models than in using vendor models, will pay premium subscription prices for relevant data base offerings.

  - Data base vendor revenues, accounting for only 10% of total data base services in 1979, will increase to nearly 15% in 1985, a 27% AAGR.

- Faced with deregulation, the transportation sector will increase industry data base expenditures at a 26% AAGR in the forecast period, as shown in Exhibit IV-12.

3. KEY DATA BASES

- Data bases serving agricultural information needs include:


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EXHIBIT IV-11

FORECAST OF USER EXPENDITURES FOR
INDUSTRY ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 4 | $ 5 | $17 | 27% |
| REMOTE COMPUTING SERVICES VENDORS | 33 | 41 | 109 | 22 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $37 | $46 | $126 | 22% |


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EXHIBIT IV-12

FORECAST OF USER EXPENDITURES FOR
INDUSTRY ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| PROCESS MANUFACTURING | $ 4 | $ 5 | $13 | 22% |
| TRANSPORTATION | 6 | 8 | 24 | 26 |
| INSURANCE | 3 | 4 | 8 | 18 |
| DISCRETE MANUFACTURING | 10 | 12 | 36 | 23 |
| ALL OTHERS | 14 | 17 | 45 | 21 |
| TOTAL | $37 | $46 | $126 | 23% |


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- DRI aggregate economic data on U.S. and international agriculture commodities. Data include supply, demand, price, production, income, futures and weather.

- CEAI aggregate economic data base, containing 14,000 historical time series and 450 forecast time series on major crop and livestock commodities.

- CEAI aggregate economic data base on fertilizer. Data include 350 time series on nitrogen, phosphate, potash and fertilizer products.

- WEFA aggregate economic data base on USDA commodities. The data base contains more than 19,000 time series including imports, exports and U.S. production.

- Tennessee Valley Authority (TVA) data base on fertilizer production capacity for the U.S. and international markets. Data are aggregated by company, product and production capacity as well as annual production and consumption data by company.

• Data bases relating to forest products are:

  - DRI Forestry Data Bank, containing data on the U.S. and Canadian lumber industries. Time series include such data as prices, production, shipments, inventories and end user consumption.

  - DRI Paper and Pulp Data Bank, containing data on the U.S. and international paper and pulp industries. Over 5,000 time series include such data as production services, imports and exports, inventory and prices.

• Data bases relating to iron and steel manufacturing are:


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- DRI Steel Data Bank, containing data on raw and finished iron and steel products. Time series covers both U.S. and international markets.

- CEAI Iron and Steel data base, containing both historical and forecast time series on iron, steel and alloys. Data cover U.S., Europe and Japan.

- Data bases relating to the insurance sector are:

  - AM Best Company's Best Executive Data Base, containing five-year time series of financial data on 38 insurance lines for each of 1,000 casualty companies.

  - DRI Insurance data base, containing time series of corporate and insurance line financial data for both life/health and property/casualty insurance companies.

  - CEAI Insurance data base, containing over 350 time series of both historical and forecast financial and operating data on life/health and property/casualty insurance companies.

  - SBC Life Rate data base, containing data on such items as premiums, cash value and dividends for life insurance. The data base contains data on over 250 American and Canadian life insurance company lines.

- Over 15 data bases were identified in the transportation sector.

  - Data bases identified with airlines:

    . The Civil Aeronautics Board (CAB) provides data to The Computer Company (TCC) for a series of six data bases containing financial and operating data from all U.S. commercial carriers. The data bases contain such data as financial, cargo and traffic statistics, passenger loading, inventory of airframes and engines, and chartered flight statistics.


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- The Official Airline Guide (OAG) maintains a data base of passenger and cargo schedules for over 600 airlines operating in the U.S. and internationally.

- The U.S. government maintains a data base of time series summarizing passengers by nationality flying between U.S. and foreign cities.

- Data bases related to automobiles:

  - DRI Automotive data bank contains 2,000 time series data on production and sales of U.S. and Canadian cars and trucks.

  - Wards' Communications maintains a comprehensive data base on production, shipments, inventory and consumer delivery of U.S., Canadian and imported trucks and passenger cars.

  - CEAI Car data base contains over 1,000 time series on production and sales of U.S. passenger cars.

  - WEFA Automotive data base contains 1,300 annual time series on price, sales, inventories, performance and import/export data.

- Data bases identified with freight shipments:

  - The Census Bureau provides data to ADP for a data base of annual values of intercity traffic by commercial class, shipment size, origin and destination.

  - DRI maintains a data base of freight traffic. Data cover rail, truck, air, water and pipeline.


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. WEFA maintains a transportation data base of over 2,300 annual time series. Data include such items as truck and rail loads, miles travelled, trip lengths, revenues and costs.

. Numerax, Inc. maintains a data base of freight rates for all classes of goods shipped by air, rail or truck between any point in the U.S. Data include such items as origin, destination, products, weight and type of carrier.

- In a joint venture with Lloyds Register and other publishers of maritime data, Maritime Data Network Limited is building data bases related to the maritime industry.

. Ships Library data base contains key data such as type, tonnage, size, speed and year built for all active maritime vessels.

. Charter Library data base contains such items as cargo leasing and contract information on all active vessels.

. Tanker Casualty Library data base contains casualty data since 1964 on all tankers over 6,000 tons.

. Ships Construction Library data base contains key data such as start and complete date, projected and actual cost, and tonnage and building yard for all maritime vessels under construction.

. Ships Purchase Library data base contains key data on all maritime vessels sold since 1964, available for sale or in the process of being sold.

- Data bases identified with discrete manufacturing:


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- The Farm and Industrial Equipment Institute maintains a data base containing annual sales and inventory of farm, industrial and construction equipment for the U.S. and Canada.

- GEISCO's data base contains annual aggregate economic data for industries in SIC Code 72, using U.S. Department of Commerce data.

- The National Electrical Manufacturers Association maintains a data base containing quarterly aggregate data on six segments of heavy industrial electric equipment.

- The Federal Trade Commission (FTC) maintains a data base containing over 4,500 time series on 42 classifications of manufacturing firms.

• Data bases associated with the construction industry:

- Construction Sciences Research Foundation offers a specification data base containing over 30,000 text pages of commercial, industrial, technical and military specifications through Bowne Information Systems' text editing system.

- The American Institute of Architects offers MASTERSPEC data base containing full-text construction specifications through Proprietary Computer Systems' (PCS) text editing system.

- William R. Orr Cost Systems Engineers, Inc. maintains a cost data base system containing historical cost data on over 2,200 projects and 45,000 items used in construction. The data base, covering over 80 U.S. cities and major cities in foreign countries, is offered through SBC.

- Comshare, Inc. maintains the VSCOM cost data base containing time series of 4,000 cost indices for the U.S. and 1,000 for 120 foreign countries. Data include construction costs for 20 U.S. locations and price modifiers for 41 U.S. locations and on 28 building types.


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4. KEY VENDOR SERVICES

- DRI offers data base services in all four major industry market sectors. Access to eight industry data bases requires subscription to DRI services as well as to the specific data bases. Although industry models are available with five industry data bases, most end users develop their own industry models. Annual subscription fees range to $40,000.

- CEAI, providing industry data base services in the process manufacturing, transportation and insurance sectors, offers subscription services including data base access and models for four industry data base offerings. Annual subscription fees range from $7,500 to $12,500.

- IDC offers access to the CEAI Agriculture and Passenger Car data bases as well as Wards' Automotive data base for subscription fees ranging up to $2,200 annually.

- Maritime Data Network Ltd., with reported growth exceeding 30%, offers maritime data base services to 40 users through GEISCO.

- SBC offers industry data base services to insurance agents and brokers for estate planning and life policy sales presentation.

- NUMERAX, Inc. provides freight tariff data base services to over 100 corporations. Services include freight bill audit, payment, least-cost shipment and optimum distribution determination. 1979 revenues of nearly $4 million are growing 40% annually.

- IMS American Ltd. offers pharmaceutical industry data base services to over 200 clients. Data base services include NTDI, which monitors physician private practices, AUDATEX, a prescription monitoring service, and MIRAD, containing drug promotion and sales indices.


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## G. LEGAL/ACCOUNTING

### 1. TYPES

- Legal/accounting data bases contain a wide variety of information on statutes, decisions, opinions, standard practices, pending legislation, and case description and annotations.

- Data bases are of three types:

  - Indices referring the user to the body of information in printed form, primarily legal/accounting journals and periodicals.

  - Citations and abstracts offering both referral and opinions or discussions of legal/accounting interpretation of printed material, usually law/accounting library books and official publications.

  - Full text of law, case summaries, legal opinions and rulings of federal and state courts.

- There has been a shift from citation and abstract data bases to full-text data bases spurred by the following factors:

  - Decreased disk storage costs.

  - Improved data base search software.

  - Increased computation speed/unit cost.

  - More sophisticated end users.


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2. MARKET FORECAST

- Although 1979 expenditures were only $75 million, the annual growth of 30% will swell user expenditures for legal/accounting on-line data base services to $360 million in 1985, as shown in Exhibit IV-13.

  - The high growth rate results from market expansion downward to the broader base of smaller law firms, increased use resulting from government disclosure requirements, and increased need to demonstrate due diligence in avoiding malpractice action.

- The major data base producers (Mead Corporation and West Publishing) are also on-line services vendors.

  - Other data base vendors, recognizing the specialized value of their data, are increasing data base subscription and access royalties, resulting in a higher (40%) AAGR.

- The Services (lawyers/accountants) sector utilizes nearly one-half (47%) of total current expenditures for this specialized data base service. However, as shown in Exhibit IV-14, legal departments of major companies in the manufacturing and banking and finance sectors are also significant users (24%).

- Growth in use by federal and state courts and legal departments is limited by both budgetary constraints and availability of an on-line legal data base system maintained by the U.S. Justice Department.

3. KEY DATA BASES

- Mead Data Central maintains a full-text data base system consisting of libraries of statutes, court decisions, regulations and legal opinions.

  - General Federal Library contains U.S. codes and U.S. Supreme Court and other federal court decisions.


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EXHIBIT IV-13

FORECAST OF USER EXPENDITURES FOR
LEGAL/ACCOUNTING ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 3 | $ 4 | $ 23 | 40% |
| REMOTE COMPUTING SERVICES VENDORS | 70 | 90 | 325 | 29 |
| DISTRIBUTION VENDORS | 2 | 3 | 12 | 35 |
| TOTAL | $75 | $97 | $360 | 30% |


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EXHIBIT IV-14

FORECAST OF USER EXPENDITURES FOR
LEGAL/ACCOUNTING ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979/1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1989 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| SERVICES | $35 | $48 | $210 | 35% |
| GOVERNMENT | 12 | 14 | 35 | 18 |
| MANUFACTURING | 12 | 15 | 55 | 28 |
| BANKING AND FINANCE | 6 | 8 | 30 | 30 |
| ALL OTHERS | 10 | 12 | 30 | 20 |
| TOTAL | $75 | $97 | $360 | 30% |


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- Federal Patent, Trademark and Copyright Law Library contains federal court decisions.

- Federal Tax Library contains Internal Revenue code, regulations, rulings and federal court decisions.

- Securities Law Library contains U.S. codes, federal court decisions and SEC rulings and interpretations.

- Trade Regulation Library contains Federal Trade Commission opinions and federal court case decisions.

- State Law Libraries contain court decisions from higher state courts for the 50 states and the District of Columbia.

• West Publishing Company maintains a legal case data base system, partly citation and abstract, and increasingly full-text. The data base contains the full text of opinions, plus case synopses and headnotes.

- Supreme Court Reporter contains the full texts of cases and synopses and headnotes.

- Federal Reporter contains the full texts of U.S. codes and cases plus synopses and headnotes of higher federal courts.

- Federal Supplement contains the full text of lower federal court cases, case synopses and headnotes.

- Military Justice Reporter contains the full texts of cases, case synopses and headnotes of higher military courts.

- State Cases contain the full texts of recent cases and case synopses and headnotes for soon-to-be all 50 states.


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- West Law Case Highlights contain information summaries on most of the recent, significant state and federal cases.

- The American Institute of Certified Public Accountants (AICPA) maintains a set of full-text data bases called the National Automated Accounting Research System (NAARS).

  - Annual Report File contains financial statements including auditors' notes and reports for some 7,000 major U.S. corporations.

  - Management Discussion and Analysis file contains annual reports of 500 major corporations.

  - Proxy File contains proxy statements of Fortune-ranked companies.

  - Accounting Literature File contains the full texts of significant accounting publications, including accounting standards, audit guides, SEC rulings and cost accounting standards.

## 4. KEY VENDOR SERVICES

- Mead Data Central's approach with the LEXIS system is to offer a total package, including a full-text law data base, remote processing, communication network, specialized terminals (desk video and free-standing hard copy) and maintenance. The terminals have special functions to make the user/system interface "friendly," inducing lawyers to do their own searching. With 1979 revenues exceeding $65 million, Mead currently dominates the marketplace.

- In addition to its legal data base, the LEXIS system also offers access to other data bases.


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- Auto-Cite is a case law citation data base of all federal law and state law. The data base, maintained by Lawyers' Cooperative Publishing Company, is used to verify the comprehensiveness of research.

- Disclosure contains submissions for all SEC-regulated companies. The data base, maintained by DISCLOSURE, Inc., the SEC document distribution contractor, contains a company profile and abstracts of significant information in SEC filings (i.e., Form 10K).

- National Automated Accounting Research System (NAARS) data base.

- West Publishing Company's approach with the West Law system is to offer access to their legal data bases through public (TYMNET) networks, encouraging the end user to use standard terminals, particularly terminals connected to in-house, computer-controlled office automation (word processing) systems, increasingly available in legal offices. The approach, meeting with great success, also allows the end user access to other services, among which are:

  - Bibliographic data bases such as the Federal Register and Congressional Record through SDC Orbit.

  - Litigation support for tracking complex cases through Aspen Systems.

- Although 1979 revenues were only $5 million, West is rapidly expanding market share.

- Lockheed's Dialog offers an index to legal periodicals produced by Information Access Corporation and an Accountants Index maintained by AICPA.

- NCSS offers the Legislex data base to lawyers and public information officers of Fortune 1000 companies. The data base tracks action on bills concerning key issues such as waste, pollution, environment and resources in state legislatures.


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## H. NEWS

### 1. TYPES

- News data bases contain information from leading newspapers such as The Wall Street Journal or the London Times, from leading wire services such as The Associated Press or Reuthers, or from leading news publications such as Barrons, Time or The London Economist.

- There are three types of data bases:

  - Index data bases, such as Information Access' National Newspaper Index, containing reference material meant to lead the user to printed information.

  - Citation or abstract data bases, such as New York Times' The Information Bank, containing summary abstracts with citations, are meant to provide key information to the user and nearly eliminate the need to refer to printed material.

  - Full-text data bases such as Mead Data Central's NEXIS, which provide the user with full source text of selected general and business publications.

- Spurred by both decreased on-line disk storage cost and improved access and search software, the market is shifting to full-text news data bases.

### 2. MARKET FORECAST

- The market for news data base services, currently at $40 million with forecasted growth of 34% per year, reaching $235 million in 1985, is currently directed toward companies and institutions, as shown in Exhibit IV-15.


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EXHIBIT IV-15

FORECAST OF USER EXPENDITURES FOR
NEWS ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 3 | $ 4 | $ 15 | 30% |
| REMOTE COMPUTING SERVICES VENDORS | 35 | 46 | 212 | 35 |
| DISTRIBUTION VENDORS | 2 | 3 | 8 | 25 |
| TOTAL | $40 | $53 | $235 | 34% |


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- Distribution systems such as Viewdata, delivering on-line news data bases to individuals (including consumers) once in place in the mid-1980s, will eventually result in explosive growth in this market segment.

- Vertical integration of data base production, remote computing and network delivery services is already taking place.

  - RCS vendors have over 80% of the current market as well as the largest growth rate (35% AAGR).

- News on-line data base services are utilized in some degree by all market sectors with the primary concentration in five sectors, as shown in Exhibit IV-16.

  - Accelerated growth (42%) in the services sector is due to new offerings tailored to news broadcasters, editors, advertising executives, lawyers and marketing personnel.

## 3. KEY DATA BASES

- New York Times Information Services maintains a data base, The Information Bank, that contains abstracts of all news from the New York Times and selected material from 10 other newspapers and nearly 50 magazines from the U.S., Canada and Europe. Items covered include news articles, forecasts, features and editorials. Nearly 1,000 items are added daily, with a four-day lag for newspapers, and correspondingly longer lags for weekly to monthly magazines. The data base is accessed by over 1,300 users through both Telenet and TYMNET.

- Information Access maintains two news data bases:

  - National Newspaper Index, a bibliographic data base on the full range of information contained in the Christian Science Monitor, The New York Times and The Wall Street Journal.


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EXHIBIT IV-16

FORECAST OF USER EXPENDITURES FOR
NEWS ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| SERVICES | $10 | $14 | $ 80 | 42% |
| MANUFACTURING | 8 | 11 | 60 | 40 |
| BANKING AND FINANCE | 6 | 8 | 30 | 30 |
| RETAIL | 5 | 7 | 30 | 35 |
| EDUCATION | 4 | 5 | 10 | 20 |
| ALL OTHERS | 7 | 8 | 25 | 25 |
| TOTAL | $40 | $53 | $235 | 34% |


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- Magazine Index, a bibliographic data base containing citations on the full range of information contained in nearly 370 popular magazines.

- Bell & Howell maintains a data base containing news citations covering nine major U.S. newspapers, including the Chicago Tribune, Los Angeles Times and Washington Post.

- Mead Data Central maintains NEXIS, a full-text data base of major newspapers, magazines and wire services. Initial coverage includes the Washington Post, four magazines including Newsweek, and two wire services, Associated Press and Reuthers General News Report.

4. KEY VENDOR SERVICES

- Until recently, New York Times Information Services, with 1979 revenues of $20 million, was the only major vendor of news on-line data base services.

  - The Information Bank is used by over 6,000 subscribers in 1,300 companies.

  - Access is via a private dial-up network in major cities via TYMNET or Telenet using standard hard copy or CRT terminals.

  - Information Bank services are being upgraded:

    . A new private network offering higher speed and wider access is being implemented.

    . New access and scan software is being integrated.

    . A shift to full text, beginning with The New York Times, is underway.


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- New York Times Information Services offers a Key Issues Tracking service to some 50 users including the U.S. government, large multinational corporations and financial institutions. The news data base service tracks world events through news reports on:

  - Two hundred fifty key issues.

  - Three hundred fifty key individuals.

  - Two hundred fifty key organizations.

- Mead Data Central recently announced entry in the news data base marketplace with its NEXIS service. The service uses the same distribution systems, access and search software, and specialized terminals as Mead uses for the LEXIS legal data base service.

- With full-text data bases of newspapers, news magazines and wire services updated shortly after publication, and with the proven LEXIS system and the financial backing of the Mead Corporation, INPUT expects Mead Data Central to accelerate expansion of the news data base marketplace.

- Besides offering the National Newspaper and the Magazines Indices on its DIALOG System, Lockheed Information Systems provides Newsearch, the ability to scan Information Access' current month's newspaper and magazine indices as citations are created on a daily basis.

- Dow Jones supplies its News/Retrieval Service, including its News Service, Stock Quote Reporter and Historical Stock Quote Reporter, using TYMNET to over 9,000 subscribers.

- Source Telecomputing Corporation offers UPI Newshare and selected Information Bank data bases as part of its The Source services to some 4,000 subscribers who access the data bases using personal computers through Telenet and TYMNET.


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- A joint venture with Ohio Cooperative Library Corporation (OCLC), Inc. will make The Source data bases available to librarians through the OCLC network.

- A number of pilot projects are underway in the U.S. to offer full-text data bases using "Viewdata" type systems to both corporate and consumer marketplaces.

  - Knight-Ridder Newspapers, Inc. expects to launch a test of a teletext service called Viewtron in 150 homes in Coral Gables, Florida.

  - Ohio Cooperative Library Corporation (OCLC) will run a three-month pilot program of home videotexts offering a wide variety of data bases to 200 homes in Columbus, Ohio.

  - GTE is sponsoring experimental use of Viewdata systems in 25 U.S. corporations. Data bases stored as "pages" in GTE's Tampa Computer Center are accessed via Telenet using specialized video terminals manufactured by Intelligent Systems Corporation.

- Although INPUT believes that widespread use of electronic data distribution to homes will not become a reality until after 1985, services to just 10% of all households represents a marketplace exceeding $1 billion.

## I. MARKETING

### 1. TYPES

- Marketing data bases are highly specialized data bases containing consumer data on such items as retail products, buying habits and radio and TV viewing preferences.


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- Marketing data bases are usually offered bundled as part of a printed subscription service. Marketing data base subscription fees of $10,000 or more are not uncommon.

- Marketing data bases are offered by the data base producer, or more often through computer services vendors who frequently offer specialized value added software useful for marketing analysis and forecasting.

- There are four types of marketing data bases:

  - Data bases that contain consumer retail product data such as the NABSCAN point-of-sale measurement data base.

  - Data bases that contain consumer audience data such as the Nielsen Television Index.

  - Data bases that contain media data such as the Broadcast Advertiser Reports data base.

  - Data bases that contain aggregate consumer economic data such as the Market Statistics data base.

2. MARKET FORECAST

- Spurred by automated data collection such as data scanners, the market for marketing data base services, just over $100 million in revenues in 1979, will rise to over $0.5 billion in 1985, a 30% AAGR, as shown in Exhibit IV-17.

- The dominant data base vendor, A.C. Nielsen, integrating proprietary data bases with computer services vendor acquisitions, will accelerate RCS market growth to 35% AAGR.

- Sustained growth in TYMNET/Telenet revenues comes from the proliferation of RCS vendors such as Management Sciences Associates, Inc. offering


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EXHIBIT IV-17

FORECAST OF USER EXPENDITURES FOR
MARKETING ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 75 | $ 96 | $330 | 28% |
| REMOTE COMPUTING SERVICES VENDORS | 27 | 35 | 168 | 35 |
| DISTRIBUTION VENDORS | 3 | 4 | 12 | 25 |
| TOTAL | $105 | $135 | $510 | 30% |


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specialty software and professional services in conjunction with marketing data base offerings.

- Retail and discrete manufacturing are the major market sectors, together comprising 64% of total 1979 marketing data base services revenues, as shown in Exhibit IV-18.

  - Both manufacturers and retail companies apply computer-aided analysis techniques both to mold and to respond to consumer buying patterns.

3. KEY DATA BASES

- The study identified nearly 20 marketing data bases. The following descriptions are illustrative of the types in active use.

- Arbitron, a Control Data Corporation subsidiary, maintains a data base of average and cumulative audience ratings of radio and TV stations. Data are aggregated by several standard statistical demographic areas as well as Areas of Dominant Influence (ADI), defining television markets by measurable viewing patterns. Audience data are gathered by weekly personal household diaries. Similar data bases are maintained by A.C. Nielsen, Inc. and Simmons Market Research Bureau, Inc.

- A.C. Nielsen maintains a retail index data base containing on-site measurements of consumer buying patterns resulting from changes in marketing and distribution efforts for a wide variety of retail products from food and drugs to wine and beer. Data are collected by field personnel using magnetic tape cassettes, either monthly or bi-monthly depending on product category. Similar data bases are maintained by NABSCAN and SAMI.

- Broadcast Advertiser Reports, Inc. (BAR) maintains a media advertising data base containing data such as expenditures by product, company and network on television commercials for over 250 television stations.


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EXHIBIT IV-18

FORECAST OF USER EXPENDITURES FOR
MARKETING ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| RETAIL | $ 42 | $ 55 | $250 | 35% |
| DISCRETE MANUFACTURING | 26 | 34 | 133 | 32 |
| PROCESS MANUFACTURING | 15 | 20 | 60 | 26 |
| WHOLESALE | 11 | 13 | 35 | 22 |
| ALL OTHERS | 11 | 13 | 32 | 20 |
| TOTAL | $105 | $135 | $510 | 30% |


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- Market Statistics, Inc. maintains a specialized data base of aggregate marketing data for over 100 items of demographic and retail sales data. The data are aggregated by standard statistical areas as well as Arbitron and Nielsen market areas.

4. KEY VENDOR SERVICES

- A.C. Nielsen, with 1979 data base subscription and computer services revenues exceeding $40 million, is still the leading vendor in what used to be Nielsen's almost exclusive market area. Nielsen, through acquisition, has integrated its marketing data bases with RCS services, which include:

  - Coordinated Management Systems, located in Minneapolis, offering retail data base services.

  - Media Research Operations Center, located in Florida, offering media data base services.

- Marketing data base services are offered by three diversified RCS vendors primarily to corporate marketing departments of major corporations.

  - Tymshare offers the SAMI data base through its Sami On-Line Service (SOLO) system.

  - Rapidata offers market research services using the Market Statistics data base.

  - ADP Network Services offers the Nielsen Retail Index to subscribers of Nielsen's report services.

- Interactive Market Systems, a leading specialist in media data base services with 1979 revenues exceeding $5 million, offers more than a dozen marketing data bases coupled with specialized software to over 450 advertising agencies and radio and TV media departments.


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- IMS concentrates its services in New York City, using TYMNET/Telenet to reach clients in other areas.

- New York Times Information Services, in a joint venture with the J. Walter Thompson Company, offers the Advertising and Marketing Intelligence (AMI) data base. The data base, used by nearly 70 major marketing and media companies, contains textual information from more than 60 major advertising and marketing publications.

- Telmar Media Systems, another leading marketing on-line data base, RCS specialty firm, with 1979 revenues exceeding $5 million, offers more than 10 marketing data bases supported by proprietary software. Services are offered to over 400 advertising agencies, publishers, broadcasters and market research companies.

  - Telmar, concentrating its services beyond New York City, uses dedicated computers and the data networks of diversified RCS vendors.

## J. CREDIT

### 1. TYPES

- Four types of credit data bases exist:

  - Consumer credit.

  - Commercial credit.

  - Check guarantee and verification.

  - Credit card verification.


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- Consumer credit data bases are highly automated.
  - Over 80% of U.S. households are on file in one or more data bases.
  - Data bases are updated using accounts receivable magnetic tapes from credit grantors.
- Commercial credit data bases are maintained by two major vendors:
  - Dun and Bradstreet, through original entry from field interviews.
  - TRW, from a combination of automated data from trade associations and from Standard and Poors.
- Check guarantee and verification data bases are created from either magnetic tape or computer-to-computer transmission supplied by participating financial institutions. Verification data bases are essentially negative account data.
- Credit card verification data bases are created from either magnetic tape or computer-to-computer transmission supplied by the participating credit card processors and associations.
- Most of the data bases are integral with the credit services offered.

2. MARKET FORECAST

- As shown in Exhibit IV-19, user expenditures for credit on-line data base services, $240 million in 1979, will exceed $700 million in 1985, a 20% AAGR.
- Revenues for RCS services will increase more rapidly than those for credit data base vendors as the Dun and Bradstreet, now an RCS vendor, places its large commercial credit data base on-line.


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EXHIBIT IV-19

FORECAST OF USER EXPENDITURES FOR
CREDIT ON-LINE DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 40 | $ 46 | $110 | 18% |
| REMOTE COMPUTING SERVICES VENDORS | 200 | 240 | 600 | 20 |
| DISTRIBUTION VENDORS | - | - | - | - |
| TOTAL | $240 | $286 | $710 | 20% |


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- Over half of all credit on-line data base services are delivered to the banking and finance and retail sectors, as shown in Exhibit IV-20.

- Growth in consumer credit data base services will grow more slowly, at a 15% AAGR.

- Growth in check guarantee and verification services is counter-cyclical to growth in credit card verification services, both services together netting a 22% AAGR.

- Commercial credit services growth, currently at a 20% AAGR, is expected to rise to a 25% AAGR as the $300 million base of Dun and Bradstreet's commercial credit operations begins to shift to RCS delivery.

3. KEY DATA BASES

- Dun and Bradstreet maintains a business information data base of over 3.5 million companies. The data base contains business location, activity, financial and credit history, as well as D&B credit rating. The data are gathered by field personnel through direct interview.

- TRW Business Credit Services, through a program with the National Association of Credit Managers, has established a business credit data base using associate receivable tapes from over 1,500 participating companies. The data base contains trade payment data, trend analysis and banking relationships for over 365,000 companies. The data base is augmented by Standard and Poors' financial information on over 30,000 corporations.

- TRW Credit Data Services, using magnetic tapes received monthly from over 7,000 companies, maintains a consumer credit data base. The data base contains information on over 70 million households, or nearly 80% of all households. Consumer credit data include identification information, factual payment information, public record information and negative credit data. Similar consumer credit data bases are maintained by Trans Union, Equifax, Chilton and ACS credit services.


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EXHIBIT IV-20

FORECAST OF USER EXPENDITURES FOR
CREDIT ON-LINE DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $ 55 | $ 68 | $185 | 22% |
| RETAIL | 75 | 86 | 175 | 15 |
| DISCRETE MANUFACTURING | 20 | 25 | 80 | 25 |
| SERVICES | 30 | 34 | 70 | 15 |
| WHOLESALE | 20 | 25 | 80 | 25 |
| ALL OTHERS | 40 | 48 | 120 | 20 |
| TOTAL | $240 | $286 | $710 | 20% |


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- Telecredit, Inc. maintains data bases for check guarantee and check verification. The data base for check guarantee is maintained from automated data received from participating financial institutions. The data base for check verification is maintained from automated data from financial and credit institutions reporting negative (bad checks, closed accounts, etc.) information. Similar check guarantee data bases are maintained by Telecheck, Inc., JBS, Inc., and selected commercial banks.

- First Data Resources maintains data bases of consumer credit card information for credit authorization and verification. The authorization data base is maintained from automated data resulting from credit card processing. The data base for verification is negative data maintained through a combination of automated data as a result of card processing and from participating financial institutions using original entry data. Similar data bases are maintained by National Data Corporation, Tymshare Transaction Services and bank card associations.

4. KEY VENDOR SERVICES

- TRW Business Credit offers business credit reports to over 2,500 users via terminals. TRW is upgrading its network with a packet-switching network purchased from Tymshare. The base report price of $3.65 can be augmented with Standard and Poors' financial data for an additional $2.25.

- Dun and Bradstreet, with over 80,000 subscribers and over 80% of the business credit reporting market, has instituted Duns Dial where credit reports can be obtained via toll-free telephone. Credit summaries are planned for terminal delivery through the NCSS network. Standard credit reports cost $6.15.

- Vendors supply consumer credit data base services to both their own and other independent credit bureaus via terminals.

  - Trans Union Credit Union supplies services to 12 of its own credit bureaus as well as 114 others.


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- Equifax supplies services to 10 of its own credit bureaus as well as 80 others.

- TRW Credit Services supplies the 21 credit bureaus it started, as well as 45 others.

- There has been a rapid shift from voice to terminal communications as the method for check and credit card authorization.

  - Telecredit has more than doubled the number of installed POS terminals to 6,500 in 1979.

- Vendor credit card authorization and verification data bases for VISA and Master Charge are accessible through the VISA and Interbank network on a national basis.

- In purchasing Validata from TRW, Tymshare Transaction Services, Inc. is extending its credit card authorization services through retail POS terminals.

## K. BIBLIOGRAPHIC

### 1. TYPES

- Bibliographic data bases contain textual information that is meant to lead the user to the source of the required information. The data base may contain indices, citations or abstracts of the source material.

- Bibliographic data bases refer to a wide body of printed information from journals, newsletters, conference proceedings, magazines, newspapers and government reports.


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- Bibliographic data bases are frequently produced as a by-product of electronic publishing.

- Professional institutes and other non-profit organizations, such as the American Psychological Association, are one major class of bibliographic data base producers.

- Government departments and institutes, particularly those of the federal government such as the National Institutes of Health, constitute another major producer.

- There are a number of profit-making companies, such as Data Courier, Inc., that are increasingly becoming subsidiaries of major publishing houses engaged in bibliographic data base production.

- Bibliographic data base producers offer on-line data base services through RCS vendors rather than directly to the user.

- On-line bibliographic data base services require sophisticated information storage and retrieval software, software which until recently had only been effective on large-scale computers with large on-line data storage capability.

- RCS vendors have in turn used packet-switching telecommunications networks such as TYMNET to reach the large number of geographically dispersed users.

- Information specialists such as librarians, trained in search techniques and articulate in key word association, frequently act as intermediaries between the bibliographic data base service and the ultimate end user.

## 2. MARKET FORECAST

- The market, currently just above $50 million, will rapidly rise to over $250 million in 1985, a 26% AAGR, as shown Exhibit IV-21.


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EXHIBIT IV-21

FORECAST OF USER EXPENDITURES FOR
BIBLIOGRAPHIC ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 9 | $12 | $ 55 | 35% |
| REMOTE COMPUTING SERVICES VENDORS | 47 | 60 | 180 | 25 |
| DISTRIBUTION VENDORS | 6 | 8 | 20 | 25 |
| TOTAL | $62 | $80 | $255 | 26% |


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- The market has come of age. Escalating labor and publication costs tilted the economics of information storage and retrieval toward on-line automation.

- Data base vendors, recognizing the time value of the data base and somewhat fearful of revenue loss from printed publications, are raising data base subscription royalties, increasing data base producer revenue growth to a 35% AAGR.

- As shown in Exhibit IV-22, the education sector is currently the largest (42%) user of bibliographic data base services. However, expenditures in the manufacturing sectors are growing more rapidly as research departments and corporate information centers with improved training expand on-line bibliographic data base usage.

3. KEY DATA BASES

- This study identified well over 150 on-line, machine-readable bibliographic data bases covering such major disciplines as:

  - Psychology.
  - Chemistry.
  - Social sciences.
  - Biological sciences.
  - General literature.
  - Business.
  - Engineering.
  - Medicine.


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EXHIBIT IV-22

FORECAST OF USER EXPENDITURES FOR
BIBLIOGRAPHIC ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| EDUCATION | $26 | $33 | $ 90 | 23% |
| GOVERNMENT | 8 | 10 | 20 | 16 |
| PROCESS MANUFACTURING | 12 | 16 | 65 | 32 |
| DISCRETE MANUFACTURING | 6 | 8 | 30 | 30 |
| ALL OTHERS | 10 | 13 | 50 | 30 |
| TOTAL | $62 | $80 | $255 | 26% |


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- Agriculture.
- Earth sciences.
- Education.

- The data base descriptions that follow are illustrative of some of the more widely used ones.

- Data Courier, Inc., a data base specialist, maintains six major data bases:
  - Conference papers index.
  - Pollution abstracts.
  - Oceanic abstracts.
  - Information system for mechanical engineers.
  - ABI/INFORM abstracts for business management and administration.
  - Pharmaceutical News Index.

- Over 11,000 subscribers access the data bases, averaging between two to four hours per month.

- The Chemical Abstracts Service of Ohio State University maintains a comprehensive chemical dictionary data base containing such items as nomenclatures, synonyms, structural data on fragments, preferred registry numbers, molecular formulae and ring system information.

- IFI Plenum Data Company specializes in patent data bases. One data base contains citations on original and reissued patents for the U.S. and Common Market countries. The other data base contains citations on chemical or chemically-related patents for the U.S. and Common Market countries.


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- Bio Sciences Information Services maintains a data base of citations on worldwide literature of research in the life sciences. Citations cover nearly 8,000 periodicals, books, conferences and research publications. Approximately 24,000 citations are added per month.

- Predicasts, Inc. concentrates on business-related bibliographic data bases. Over 5,000 subscribers access the following data bases, averaging between two to three hours per month.

  - PTS F&S indices, containing citations on worldwide literature on companies, products and industries.

  - PTS federal index, containing citations and abstracts on government operations appearing in the Washington Post, Congressional Record, Federal Register and Commerce Business Daily.

  - PTS PROMPT, containing citations and abstracts of worldwide literature on new business activities for major industries. Data include sales and income by product line for Fortune 1000/300 companies.

  - PTS U.S. forecasts, containing citations and data from published forecasts of products, industries and the economy.

  - PTS International, containing citations and data from published forecasts of products, industries and foreign economies.

- Adding over 2,500 abstracts per month, the American Psychological Association maintains a data base containing citations and abstracts of world literature on psychology and the behavorial sciences, from applied psychology, social psychology, and physiology to industrial psychology of groups and organizations.


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4. KEY VENDOR SERVICES

- System Development Corporation (SDC), with 1979 revenues of $6 million, provides on-line data base services offering over 50 bibliographic data bases. Orbit Information storage and retrieval services are offered using both the TYMNET and Telenet package-switching networks to well over 15,000 users.

- Lockheed Information Systems (LIS), with 1979 revenues of $12 million, offers over 90 bibliographic data bases through its Dialog system. Well over 20,000 subscribers access the data bases through TYMNET and Telenet. LIS is establishing a data center in Japan, expanding information storage and retrieval services worldwide.

- Bibliographic Retrieval Services (BRS) Inc., a recent market entry (1976), has managed to establish itself as a viable bibliographic data base services vendor, offering access to nearly 30 data bases plus a private data base service. BRS's 1979 revenues approached $3 million.

- Ohio Cooperative Library Corporation (OCLC) offers an on-line cataloging data base to over 3,000 libraries. The data base is expanded by participating libraries entering new cataloging information which is then shared. 1979 revenues were nearly $25 million.

- The U.S. National Library of Medicine, a government agency, operates the largest information and storage retrieval system for medical information. The system, originally developed and operated by SDC, offers 15 major data bases to over 10,000 medical institutions spending in excess of $20 million (not included in INPUT forecast) in 1979.

## L. PROPERTIES

1. TYPES

- There are two types of properties data bases:


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- Physical properties data bases containing key parameters of known chemical compounds used in chemical process engineering.

- Properties data bases used primarily in the identification of compounds in conjunction with scientific research and environmental protection.

- Restructuring properties data bases (currently stored as files accessed by specialized search routines) into data bases managed by more current DBMS, is necessary to increase efficiency and induce more widespread use.

- Large process manufacturing companies such as Union Carbide frequently maintain private physical properties data bases. The data bases are usually for a limited range of compounds at limited ranges of temperature and pressure. These data bases can frequently be enhanced and offered through RCS vendors.

- Properties data bases are usually closely tied to specialty software used for searching the data base, for data extrapolation and for using the data in an analysis or simulation.

## 2. MARKET FORECAST

- As shown in Exhibit IV-23, the market for properties data base services, currently just over $20 million, will approach $100 million in 1985, as more integrated properties data base offerings accelerate growth at a 27% annual rate.

- Data base producers offering specialized modeling and graphics software in conjunction with their data bases will continue to demand higher subscription royalties for their products.

- Process manufacturing is the major market sector, utilizing over half (59%) of the total user expenditures for properties data base services, as shown Exhibit IV-24.


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EXHIBIT IV-23

FORECAST OF USER EXPENDITURES FOR
PROPERTIES ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $15 | $19 | $70 | 30% |
| REMOTE COMPUTING SERVICES VENDORS | 6 | 8 | 22 | 25 |
| DISTRIBUTION VENDORS | 1 | 1 | 3 | 20 |
| TOTAL | $22 | $28 | $95 | 27% |


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EXHIBIT IV-24

FORECAST OF USER EXPENDITURES FOR
PROPERTIES ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| PROCESS MANUFACTURING | $13 | $17 | $64 | 30% |
| EDUCATION | 3 | 4 | 11 | 25 |
| GOVERNMENT | 2 | 2 | 6 | 20 |
| MEDICAL | 1 | 1 | 4 | 25 |
| ALL OTHERS | 3 | 4 | 10 | 22 |
| TOTAL | $22 | $28 | $95 | 27% |


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- The medical sector, a major user of properties data bases for medical research, obtains the major portion of its requests for properties data from the U.S. National Library of Medicine Information system. User expenditures exceeding $20 million are not forecast in this study.

## 3. KEY DATA BASES

- Chemshare maintains a physical properties data base of more than 750 organic and some inorganic compounds used by the petrochemical industry. Adding approximately 200 compounds per year, the data base contains such properties as:

  - Molecular weights.
  - Boiling points.
  - Ideal gas heat capacity.
  - Solubility parameters.
  - Liquid densities.
  - Vapor pressures.

- Support software includes a physical properties generator that estimates and correlates physical properties based on user-supplied bond structure and molecular rates. A similar data base is maintained by Simulation Sciences, Inc.

- The National Institutes of Health (NIH) and the Environmental Protection Agency (EPA) maintain a number of property data bases as part of the Chemical Information System (CIS). The data bases contain primarily numeric and chemical structural data. The CIS contains the related search and analysis software, including:


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- Structure and Nomenclature Search System (SANSS), a data base of over 14,000 compounds containing such items as molecular formulae, structural designs, synonyms and trade names.

- Mass Spectral Search System (MSSS), a data base of electron impact mass spectra for over 30,000 compounds and ionization spectra for over 500 chemical compounds.

- Oil and Hazardous Materials (OHM), a data base of over 1,000 materials related to oil spills and other materials affecting water quality.

- Toxic effects of chemical substances, a data base with over 40,000 toxicological measurements.

- Powder Diffraction, a data base containing powder diffraction patterns for over 33,000 compounds.

- Carbon 13 Nuclear Magnetic Resonances Spectra, a data base of spectra for over 8,500 compounds.

- X-Ray Crystallographic Search System (CRYST), a data base containing atomic coordinates and cell parameters for about 15,000 compounds.

- Sadtler Research Laboratories maintains a data base of over 100,000 infrared spectra for over 20 substance classes, from pure compounds and natural resins to petroleum pharmaceuticals and inorganics. Related software allows the user to enter spectrum and chemical/physical data as an unknown and have the data base searched for the 20 most clearly matching spectra.

- The Institution of Chemical Engineers maintains a Physical Properties Data Base System (PPDS) comprising three data bases:

  - Physical Properties data base, containing 17 constant and 15 variable properties of 400 compounds up to 4000°C.


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- Vapor Liquid Equilibrium (VLE) parameters data base for compounds at temperatures ranging from 70°C to 130°C.

- Steam Tables data base of variable properties of water at wide ranges of temperature and pressure.

- Support software allows use of combinations of data bases or user-supplied data.

4. KEY VENDOR SERVICES

- Interactive Sciences, Inc. offers the Chemical Information System (CIS) via Telenet to over 350 research and scientific users at research labs, universities, petrochemical companies and governments. Current revenues exceeding $1 million have been growing at a 75% annual rate.

- Three RCS vendors, UCC, USC and CDC, offer the CHEMTRAN system to over 400 users for chemical process engineering. Chemshare revenues, between $5-6 million in 1979, are growing at a 30% AAGR.

- The Physical Properties DataBase System (PPDS), offered by both GEISCO and UCS, is being integrated with simulation software from The Heat Transfer Research Institute (HTRI) for use in process equipment design.

- The IRIS data base, offered by UCC, is used by oil and gas development companies to identify substances during exploration.

- UCC, in a joint development effort with Celanese, is building a chemical properties data base system using a DBMS. A minicomputer controlled graphics terminal is being used to correlate and smooth properties data entered in the data base.

- Over 40 companies are funding a Design Institute for Physical Properties Research (DIPPR) for the development of a comprehensive properties data


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base for widespread use by the membership of The Institute of Chemical Engineers.

## M. REAL ESTATE

### 1. TYPES

- Two types of real estate data bases exist:
  - Data bases containing textual and numeric information about residential real estate offerings through real estate agents and brokers.
  - Numeric data bases used for micro (e.g., appraisal, cost) or macro (e.g., housing and mortgage markets) economic analysis.
- Residential real estate data bases are tied directly to on-line data base vendor services.

### 2. MARKET FORECAST

- Following a 20% growth constrained by depressed housing markets, this specialty market, with $45 million in revenues in 1979, is expected to grow at a 25% AAGR, reaching $175 million in 1985, as shown in Exhibit IV-25.
- Alert data base vendors have leveraged their data bases with remote computer services offerings using public packet-switching (Telenet) networks.
- As shown in Exhibit IV-26, real estate agents and brokers in the services sector are the major users (89%) of data base services.


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EXHIBIT IV-25

FORECAST OF USER EXPENDITURES FOR
REAL ESTATE ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 1 | $ 1 | $ 5 | 30% |
| REMOTE COMPUTING SERVICES VENDORS | 44 | 52 | 168 | 25 |
| DISTRIBUTION VENDORS | - | 1 | 2 | 15 |
| TOTAL | $45 | $54 | $175 | 25% |


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EXHIBIT IV-26

FORECAST OF USER EXPENDITURES FOR
REAL ESTATE ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| SERVICES | $40 | $48 | $158 | 26% |
| BANKING AND FINANCE | 2 | 2 | 7 | 23 |
| ALL OTHERS | 3 | 4 | 10 | 22 |
| TOTAL | $45 | $54 | $175 | 25% |


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## 3. KEY DATA BASES

- Planning Research Corporation (PRC) Realty Systems maintains data bases of residential offerings in 96 cities throughout the U.S. Multiple-listing data are entered either by the listing broker or by the governing board of realtors. The data base contains residential properties for sale or sold in the past year. Similar data bases are maintained by McGraw-Hill and Moore Business Systems.

- Marshall and Swift Publications offers a replacement cost data base for both residential and commercial real estate. The data base contains standard cost data and local cost multipliers for each area of the U.S. and for 100 building types. Cost data for over 100 components of building construction are updated at least quarterly.

- The Society of Real Estate Appraisers (SREA) maintains data bases of market valuation of residential real estate in California, Texas, Colorado, Georgia and Ohio. Data bases are currently under development for 21 other states. The data bases contain data on appraisal components, valuations and prices paid for homes sold by local assessment areas.

- Regional Data Associates (RDA) maintains a data base of over 10,000 time series of aggregate data on residential and commercial housing activities, costs and housing mortgage market activity. The data base covers the U.S., states and SMSAs. RDA offers both forecasts and modeling software for use in conjunction with the data base.

- The National Association of Home Builders (NAHB) maintains a data base of quarterly aggregate data on approximately 175 housing and mortgage market items. The time series covers such items as actual single and multiple family housing starts, completions, housing stocks and mortgage market economic data. The data are available on a national and regional basis. Both long-range forecasts and modeling software are also available.


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4. KEY VENDOR SERVICES

- PRC Realty Systems offers its on-line real estate data base service as a turnkey system. The system uses HP minicomputers, a local dial-up network and TI terminals. The service, priced under $200 per month including terminal, is installed in over 10,000 offices in nearly 100 cities. With 1979 revenues approaching $25 million, PRC has nearly 60% of market share.

- Marshall and Swift Publications, with services available through Telenet to over 2,000 contractors, appraisers, S&Ls, mortgage bankers, insurance agents and real estate brokers, offers two approaches to real estate valuations:

  - Replacement cost using its data base.

  - Market price using the SREA data base.

- Widespread use of inexpensive computer terminals in small businesses for word processing, office automation and agency management and accounting has accelerated the market for real estate valuation data base services.

- Interactive Data Corporation (IDC) offers both the NAHB and RDA data bases, associated forecasts, and modeling software. In addition to accessing the forecasts and models through IDC's XSIM system, end users access the data bases directly for such applications as:

  - Market forecasts of consumer household products such as bathroom fixtures.

  - Market forecasts of building materials on a regional basis where climate-dependent.

  - Forecasting increased residential energy demand by public utilities.

  - Financial planning in the mortgage market by S&Ls, mortgage bankers and mortage insurance companies.


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## N. INTERNATIONAL

### 1. TYPES

- International data bases, containing information about a foreign country or continent, although initially created and maintained by U.S. producers, are more recently being produced and maintained by foreign organizations. The organizations, frequently government sponsored, offer the data bases through U.S. RCS vendors.

  - Although not covered in this study, international data base services are beginning to be offered directly to U.S. end users through improved international telecommunications networks.

- The last three years have seen a proliferation of international data bases covering virtually all of the types discussed above for the U.S. The major portion, however, are either econometric or financial and economic.

- Over 30 data bases were identified during the study covering one or more countries. The data bases identified below are illustrative of the widening availability of data bases dealing with foreign economies.

### 2. MARKET FORECAST

- Spurred by the increased availability of data bases on foreign economies and industries, the market for international data base services will rise at a 25% AAGR, reaching nearly $70 million in 1985, as shown in Exhibit IV-27.

- Using expanded international telecommunications networks, data base vendors will improve value added revenues by offering greater timeliness and improved accuracy of data base offerings through U.S. RCS vendors.


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EXHIBIT IV-27

FORECAST OF USER EXPENDITURES FOR
INTERNATIONAL ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 5 | $ 6 | $22 | 28% |
| REMOTE COMPUTING SERVICES VENDORS | 12 | 15 | 41 | 23 |
| DISTRIBUTION VENDORS | 1 | 1 | 5 | 30 |
| TOTAL | $18 | $22 | $68 | 25% |


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- As shown in Exhibit IV-28, Fortune 500 companies in the manufacturing sectors engaged in international markets are the prime (44%) users of international data base services.

- The economic and trading departments of commercial banks, both domestic and foreign, together with other financial institutions in the banking and finance sector, are increasing expenditures for international data base services to support corporate clients.

3. KEY DATA BASES

- The Organization for Economic Cooperation and Development (OECD) maintains the most widely used data bases of aggregate economic statistics for 25 participating countries including the Common Market and Japan. The data base, available to U.S. users through DRI, IDC and CSC, includes:

  - Main Economic Indicators, containing 9,000 time series.

  - Quarterly National Income Accounts, containing 1,300 time series.

  - Annual National Income Accounts, containing 12,000 time series.

  - Foreign Trade Statistics, containing 19,000 monthly time series.

- Business International (BI) Inc. maintains a data base on 130 countries, containing over 20,000 historical and forecast annual time series on such items as national accounts, foreign trade, production and consumption.

- Economic Models Limited (EML) maintains industry data bases on nine countries including the Common Market and Japan. The data base contains both historical and forecast data for automotive, energy, chemicals and paper products industries.


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EXHIBIT IV-28

FORECAST OF USER EXPENDITURES FOR
INTERNATIONAL ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $ 6 | $ 8 | $26 | 28% |
| PROCESS MANUFACTURING | 4 | 5 | 15 | 25 |
| DISCRETE MANUFACTURING | 4 | 5 | 15 | 25 |
| GOVERNMENT | 2 | 2 | 6 | 20 |
| ALL OTHERS | 2 | 2 | 6 | 20 |
| TOTAL | $18 | $22 | $68 | 25% |


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- Extel Computing Limited offers a financial data base on over 20,000 securities for England, Europe, Australia, the Far East and Africa. The data base contains over 40 items of both current and historical data including price, dividend, option and key financial statement elements. Both SBC and IDC offer the data base to U.S. end users.

- The International Monetary Fund (IMF) maintains a data base containing over 100,000 time series of import and export statistics for over 230 nations and their corresponding trading nations.

- The International Monetary Fund also maintains a data base on international financial statistics containing over 28,000 time series on over 150 countries, and aggregate data on 50 regions and the world.

- Foreign exchange data bases are maintained by five vendors:

  - International Marine Bank data base, containing current and historical data on 34 major currencies.

  - IDC data base, containing bid and sale quotes for 15 currencies and interest rates on Eurocurrencies.

  - CEAI forecast data base, containing 165 quarterly time series of exchange-related items for 11 currencies.

  - ContiCurrency, Inc. data base, containing currency-related data and historical and market direction forecasts for 33 currencies.

  - I.P. Sharp data base, containing current and historical data from six major world exchanges covering over 60 currencies.

- Four data bases are now offered on Japan's industry and economy:


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- NIKKEI data base, containing 2,400 time series including income, production, trade, balance of payments and household expenditures.

- Industrial Bank of Japan data base, containing 35 items of financial statistics on 100 major Japanese companies.

- Nomura Research Institute data base, containing 3,200 time series of both general economic and industrial, and specific industrial data, both historical and forecast.

- CEAI macroeconomic data base, containing 250 time series of both historical and forecast including economic indicators.

- In addition to Japan, specific data bases are available for the following countries:

  - Canada, maintained by Datacrown Ltd., containing over 300,000 time series issued by Statistics Canada.

  - Mexico, maintained by WEFA, containing over 1,000 time series covering 46 industrial sectors.

  - Brazil, maintained by WEFA, containing time series on such items as financial data, foreign trades, balance of payments and price indices.

  - England, maintained by the Central Statistical Office, containing 2,000 time series on such items as national income accounts, payments, price indices, wages and earnings, and available through IDC and ADP to U.S. end users.

- European-American Bank maintains a data base containing annual time series financial information on over 1,000 banks in 72 countries in Europe, North and South America and Australia.


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- Securities Data Company maintains an international data base of new securities as issued. Security types include common and preferred stock, convertible and non-convertible debt and tax-free debt.

- DRI has greatly expanded its aggregate economic international data base offerings:

  - European National Source data base, covering the European Economic Community (EEC), Spain, Sweden and Switzerland.

  - East Asian data base, containing over 3,000 time series on 11 East Asian countries.

  - Developing Countries data bank, containing primary statistical information on developing countries in Africa, Asia and Latin America.

  - International Energy data base, containing over 270,000 time series on leading services and uses for all major fuels for most major nations.

## 4. KEY VENDOR SERVICES

- In a joint venture with SRI International, WEFA offers, for an annual subscription fee approaching $20,000, a World Economic Model supported by a data base covering over 3,500 time series for over 32 countries and global areas.

- CEAI offers, for an annual subscription fee of $12,500, an international forecasting data base service, covering over 500 quarterly and annual projections of national accounts for 12 major industrial nations including England, Europe, Japan and the U.S. Forecasts are for nine quarters and up to ten years.

- Taking advantage of its international timesharing network, GEISCO is expanding international data base offerings with:


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- BI data base, together with BI System Software, permitting users to forecast economic activity based on such factors as constant prices, base year exchange rates or selected common currencies.

- Industrial Bank of Japan financial data base on 100 major companies.

- Nomura Research Institute data base and forecasting software.

- International Marine Bank data base on foreign exchange rates.

- CSC, concentrating data base offerings in international markets, provides EML data bases and economic models to Fortune 500 companies.

  - EML Auto model provides short-term forecasts, quarterly up to two years, and a long-term model, annually for up to seven years.

  - EML Fuel model provides long-range forecasts annually for up to 20 years.

  - EML models for chemical and paper industries are under development.

- DRI offers only data base subscription services, ranging up to $40,000 annually, for its international data base offerings.

  - End users build their own econometric models using DRI access and modeling software and professional services.

- ADP offers selected international data base services related to financial markets.

  - International Financial Statistics from the IMF.

  - International Securities from Securities Data Company.


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- Foreign Exchange from ContiCurrency.

## O. OTHER

### 1. TYPES

- Classified under "other" are data bases oriented toward the consumer and data bases not classifiable in one of the above 14 subsectors. Those included here, although not exhaustive, are further indications of the almost unlimited variety of available data upon which to base computer services offerings.

- Data bases included under "other" are:

  - Actuarial data bases, containing data related to births, longevity, health and other population demographics.

  - Funding data bases, containing textual data on available government and foundation grant programs.

  - Technology data bases, containing specialized textual data related to technology transfer.

  - Travel data bases, containing data on such items as airline, hotel and automobile reservations and travel plans.

  - Leisure data bases, containing data on entertainment and recreation.

  - Personnel data bases, containing textual data on qualified employment candidates.


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2. MARKET FORECAST

- The market for "other" on-line data base services, estimated at $140 million in 1979, will increase to over $400 million by 1985, a 26% AAGR, as shown in Exhibit IV-29.

- The major portion (88%) of "other" data base services identified are tied to RCS vendor offerings.

- As shown in Exhibit IV-30, the transportation and services sectors, where services to consumers are related to travel, entertainment and recreation, together garner the major portion (70%) of user expenditures.

- High growth (30% AAGR) in the transportation sector results from two factors:

  - Increased travel agency automation.

  - Increased variety and complexity of services offerings resulting from industry deregulation.

3. KEY DATA BASES

- The wide variety of "other" data bases is illustrated by examples of three types.

- Actuarial:

  - I.P. Sharp maintains an Actuarial data base containing mortality data on population by such factors as age, sex, marriage and health habits. Data items also include financial data on life insurance including annuities.


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EXHIBIT IV-29

FORECAST OF USER EXPENDITURES FOR
OTHER ON-LINE
DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 15 | $ 19 | $ 70 | 30% |
| REMOTE COMPUTING SERVICES VENDORS | 120 | 150 | 475 | 26 |
| DISTRIBUTION VENDORS | 5 | 6 | 15 | 22 |
| TOTAL | $140 | $175 | $560 | 26% |


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EXHIBIT IV-30

FORECAST OF USER EXPENDITURES FOR
OTHER ON-LINE
DATA BASE SERVICES BY INDUSTRY SECTOR,
1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| MANUFACTURING | $ 10 | $ 12 | $ 40 | 25% |
| TRANSPORTATION | 40 | 52 | 190 | 30 |
| INSURANCE | 10 | 12 | 30 | 20 |
| SERVICES | 60 | 75 | 240 | 26 |
| ALL OTHERS | 20 | 24 | 60 | 20 |
| TOTAL | $140 | $175 | $560 | 26% |


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- STSC, Inc. maintains a data base containing standard and most frequently used mortality tables for the U.S., England, France and West Germany.

- Funding:

  - The Foundations Center offers a text data base through LIS containing data on U.S. private foundations and grants awarded.

  - The Office of Management and Budget (OMB) offers, through both GEISCO and SBC, a data base containing textual data on more than 1,000 federal assistance and loan programs.

- Technology:

  - CDC maintains a technology data base system containing over 20,000 textual items about technology transfer in over 30 countries, including:

    . TECHNO-STOCK, containing offers of technology.

    . TECHNO-QUEST, containing requirements and joint-venture opportunities.

    . TECHNO-AIDE, containing available consultants.

    . SOLAR TECHNOLOGY, containing specialized information in the solar field.

    . MINORITY VENDORS, containing available small business enterprises engaged in technology.


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- Dr. Dvorkovitz & Associates offers a technology data base containing textual data on over 20,000 items and technology that are licensable. The data base, covering both U.S. and international technology, is structured in 100 groups and supported by specialized search software.

4. KEY VENDOR SERVICES

- There is a growing market in "private" data base development. Data base and RCS vendors offer their expertise and specialty software to create data bases of a company's technical, research, information or corporate data not usually related to mainline operations. Once created, the data base can either be used internally or offered on subscriptions through RCS.

- Cuadra Associates, Inc. has developed a data base for Washington Representative Services, Inc. of references on offerings and awards in the U.S. Commerce Business Daily (CBD). The data base is then offered through SDC.

- UCC is developing a properties data base system with Celanese, with the plan to market both the properties data base and data base system as a product offering.

- BRS, Inc. is offering a minicomputer-based data base development service, assisting companies in creating and maintaining private data bases. The private data base, once created, is loaded on BRS mainframes for access by the end user through the user site minicomputer using BRS-supplied research and retrieval software.

- Project Green Thumb, supervised by the University of Kentucky, integrates an agricultural product and market data base, maintained on an HP 3000, with a weather data base, maintained on a Western Union GS-200 processor and Tandy corporation end user TV/Phone terminals. The experimental data base service enables 200 farmers to request weather information and market and specialized agricultural data.


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- American Airlines (AA), United Airlines (UAL) and, more recently, ITT Electronic Travel Services, Inc. are offering travel data base services to travel agents. AA, with 1,800; UAL, with 1,400; and ITT, with 300 agencies, serve the larger 20% of some 17,000 travel agencies.

  - Besides interconnecting the reservations data bases of airlines, hotels and rental cars, travel data base services offer tour information, weather, currency exchange rates and available entertainment.

  - American Express, implementing its own Travel Information Processing System (TRIPS) in over 1,000 offices worldwide, will offer travelers check, credit card and tour data base services as well as including travel preference information in a customer data base.

- As part of its Ticketron network, CDC maintains a data base containing reservation information on entertainment and recreation. Ticket purchases for everything from campsites to gallery exhibitions are available through over 1,000 terminals nationwide.

- As part of its CYBERSEARCH service, CDC maintains a personnel data base containing qualified applicant information which can be matched on a national basis with client job specifications.


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# V PRODUCT AND MARKETING ISSUES

# V PRODUCT AND MARKETING ISSUES

## A. PRODUCT STRATEGIES

### 1. DATA BASE SOURCES

- As was shown in Chapter IV, Market Analysis by Data Base Subsector, data bases are available from an almost infinite variety of sources.

- Trade and professional associations are one potential data source.

  - Data bases may need automating before being offered.

  - Association members are frequently willing to help create and maintain data bases by supplying individual company data on magnetic tape.

  - The Encyclopedia of Associations lists over 10,000 associations in the United States.

- Both federal and state governments - gatherers of untold masses of data - are still possible sources of data bases.

  - Government agencies at times award contracts both to maintain data bases and to offer them on a fee-for-service basis to interested end users.


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- State and county governments remain a virtually untapped source.

- The data base of the National Technical Information Service's (NTIS) publications is offered by SDC, LIS and BRS.

- Publishers of all types, particularly specialty publishers of such information as trade data, industry statistics and marketing information, are good candidates.

  - Specialty publishers can often be offered electronic publishing services to automate data bases as a by-product of printed publication.

  - Sales and Marketing Management's annual survey statistics indicate that there are well over 2,000 newspaper, periodical and book publishing houses in the U.S.

- Market research firms, particularly those dealing with the consumer marketplace, are good possibilities for data base development.

  - Such data bases have extremely high value added potential.

- Engineering and technical consulting firms dealing in capital-intensive areas could well have data which, when automated and combined with specialty software, result in high value added, on-line data base offerings.

- It is possible to create situations where users can be induced first to help create and then to use data bases.

  - Trading and credit data bases are typical examples.

- The rapid increase in the number of international data bases available through domestic RCS vendors is ample evidence of the value of imported data.


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## 2. DATA BASE PRICING

- Typical data base pricing methodologies are shown in Exhibit V-1.

- Most data base pricing schemes have two components:

  - Annual (monthly) subscription price.

  - Individual data base item access, display or printing charge.

- Data base vendors with highly proprietary data are able to require end users to buy a package of services including data bases at premium prices.

  - DRI packages report, professional services, econometric models and data bases for annual subscription fees of up to $40,000.

  - A. C. Nielsen requires end users to buy a package of retail services prior to subscribing to the related retail index data base at annual fees of up to $10,000.

- Data base vendors able to combine data bases with proprietary software receive double value added for their offerings. This method is particularly valid for offerings in areas requiring high capital and development cost.

  - Chemshare, with Chemtran, combines a properties data base with process engineering simulation software.

  - Petroleum Information Company, with DAAS, combines a resources data base with sophisticated financial analysis software for oil and gas well development.

  - CSC, with Search, combines a resource data base on offshore oil and gas well historical development costs with specialized software for analysis and forecasting of future development profitability.


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## EXHIBIT V-1

## TYPICAL DATA BASE PRICING ARRANGEMENTS FOR ON-LINE DATA BASE SERVICES

| TYPE NAME | NAME | DATA BASE VENDOR | RCS VENDOR | SUBSCRIPTION COSTS | ACCESSING COST | ROYALTY ARRANGEMENTS |
|---|---|---|---|---|---|---|
| ECONOMETRIC | U.S. MODEL DATA BANK | DRI | DRI | $16,000 ANNUAL | NO SURCHARGE | – |
| FINANCIAL AND ECONOMIC | BANKANAL | ROBINSON-HUMPHREY | SBC | – | $25 SURCHARGE PER BANK ACCESSED EACH SESSION | ACCESSING COSTS |
| FINANCIAL AND ECONOMIC | COMMODITY | CEAI | IDC | $2,000 ANNUAL | NO SURCHARGE | SUBSCRIPTION COST + PERCENT T/S COSTS |
| FINANCIAL AND ECONOMIC | FRBSF | FRBSF | RAPIDATA | $100 INITIATION $80 MONTHLY | – | SUBSCRIPTION COSTS |
| FINANCIAL AND ECONOMIC | VALUE LINE | ARNOLD BERNHARD | TYMNET | $5,000 ANNUAL $1,500 QUARTERLY | $0.07/ITEM FOR NONSUBSCRIBERS | SUBSCRIPTION + ACCESS + PERCENT OF T/S COSTS |
| RESOURCES | DAAS | PIC | GEISCO | – | $30 TO $600/ SESSION DE-PENDING ON DATA ACCESSED | ACCESSING COSTS 20% T/S COSTS |
| INDUSTRY | MARDATA | MMS | GEISCO | $1,000 TO $4,000 DEPENDING ON NUMBER OF SHIPS DATA BASES | NO SURCHARGE | SUBSCRIPTION COSTS + PERCENT OF T/S COSTS |
| INDUSTRY | INSURANCE FORECAST | CEAI | IDC | $7,500 ANNUAL | NO SURCHARGE | SUBSCRIPTION COST + PERCENT T/S COSTS |
| LEGAL | LEXIS | MEAD | MEAD | $500 MONTHLY IN-CLUDING TERMINAL + COMMUNICATIONS $100 MONTHLY FOR HARD COPY PRINTER | $48 TO $112/HOUR CONNECT TIME AND $195/HOUR SEARCH TIME DEPENDING ON MINIMUM MONTHLY USE | – |

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EXHIBIT V-1 (CONT.)

TYPICAL DATA BASE PRICING ARRANGEMENTS FOR ON-LINE DATA BASE SERVICES

| TYPE | NAME | DATA BASE VENDOR | RCS VENDOR | SUBSCRIPTION COST | ACCESSING COST | ROYALTY ARRANGEMENTS |
|---|---|---|---|---|---|---|
| NEWS | DOW JONES/ NEWS RETREIVAL | DOW-JONES | DOW-JONES | BROKERS $200 MONTHLY PUBLISHERS $200 MONTHLY OTHERS $50 MONTHLY | $40/HOUR | SUBSCRIPTION + ACCESSING COSTS |
| NEWS | KIT | INFO BANK | INFO BANK | $3,000 ANNUAL SINGLE SITE $4,800 ANNUAL MULTIPLE SITES | $90/HOUR | – |
| MARKETING | RETAIL INDEX | A.C. NIELSEN | IMS | PACKAGED WITH REPORT SERVICES $10,000 ADDITIONAL ANNUAL DEPENDING ON CATEGORY | NO SURCHARGE | SUBSCRIPTION COSTS PAID DIRECTLY TO A.C. NIELSEN |
| BIBLIOGRAPHIC | IN PTS F&S INDEXES | PTS | LIS | $500 MONTHLY | $0.20/RECORD PRINTED FOR SUBSCRIPTIONS $0.50/RECORD ACCESSED OTHERWISE | SUBSCRIPTION COSTS + ACCESS COSTS |
| BIBLIOGRAPHIC | ABI/INFORM | DATA COURIER | BRS | – | $35/HOUR + $10 PER CITATION DISPLAYED | ACCESSING COSTS |
| PROPERTIES | CIS | NIH | ISC | $300 ANNUAL | $36 TO $60/HOUR DEPENDING ON DATA BASE ACCESSED | FEE FOR SERVICE GOVERNMENT CONTRACT |
| INTERNATIONAL | EURABANK | EAB | SBC | – | $15 SURCHARGE PER BANK ACCESSED EACH SESSION | ACCESSING COSTS |
| INTERNATIONAL | EXTAT | EXTEL | ADP | $4,000 ANNUAL (UNLIMITED) | $10/ITEM ACCESSED WITH MINIMUM MONTHLY $100 MAX MONTHLY $700 | SUBSCRIPTION OR ACCESSING COSTS |

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- There is a spectrum of royalty arrangements between data base and RCS vendors.
  - A high subscription price up front, plus 5-15% of RCS-related revenues.
  - A surcharge as connect time, plus an item display (print) cost, with 15-50% of the surcharge plus item display costs going to the data base vendor and no up-front subscription price.
  - No up-front subscription price or access charge, with built-in surcharges on RCS time, yielding a 20% average of total RCS revenues to the data base vendor.
  - Combinations and permutations of the above.
- Pricing mechanisms are moving away from the connect time component due to two factors:
  - 1200-4800 bps line speeds which reduce the connect time.
  - Intelligent terminal (micro, mini) systems with sufficient disk capacity to copy large portions of data bases for local access, search and analysis.
- Pricing mechanisms are tending toward pricing components based on data base access (search), and item "hits" (display, printer, selected for computation).
- Data base vendors, in general becoming better aware of data content value, are raising royalty requirements, thereby frequently decreasing RCS vendor revenue margins.


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## 3. SPECIAL TECHNICAL REQUIREMENTS

### a. Software

- Four types of software are needed to support on-line data base services. Specific content and operation are a function of related data base type.

  - System software for data base access and research.

  - System software for end user model building.

  - Vendor-supplied models.

  - Vendor-supplied proprietary application software.

- Highly sophisticated and efficient information storage and retrieval software is required to access and search bibliographic, news and legal data bases.

  - The key to efficient access and search techniques for bibliographic data bases is the ability to rapidly scan key word indices compiled during data base creation and maintenance.

  - Textual data base search requires efficient indexing and scanning techniques.

- Economic and financial, econometric, and other types of data bases containing numeric data stored in time series, are accessed and searched with tailored data base management systems which can take advantage of the fixed-array nature of the data bases.

- Some data bases, stored as data files, use access and search software specific to the particular data base.


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- Most file-oriented data bases were created before the availability of efficient DBMS and are prime candidates for DBMS conversion.

- System software tools are needed by end users to develop and implement their own software.

  - INPUT's "Financial and Management Planning Systems and Software" study outlines the desired attributes of modeling software systems for use with a variety of accessible data bases.

  - INPUT's "Remote Computing Services Markets for Economic and Financial Data Bases" study outlines software requirements for analysis using sophisticated estimation techniques and econometric modeling.

- Vendor-supplied models, when widely accepted by the end users involved, can be a highly profitable value added component of on-line data base services' offerings. Examples are:

  - Interest rate forecasting models, using economic and financial data bases.

  - Chemical processing simulation models, using properties data bases.

- Probably the best way to add incremental value to data base offerings is to devise software solutions for a specific class of end user needs. Adding applications software to the on-line data base offering increases its proprietary nature, differentiating the product from similar competitive offerings. Examples are:

  - PLANIT from Telmar Media Systems, using the Arbitron T.V. data base.

  - BANKSITE, using the Urban Decisions demographic data base.

  - BANCALL II from ADP, using the FDIC data base.


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- VALPORT from SBC using the Frederick Tower securities data base.

b. Terminals

- Both general-purpose and special-purpose terminals are used with on-line data base systems.

  - General-purpose terminals include both CRT and hard copy.

  - Special-purpose terminals orient towards making user interface "more friendly." Examples are GTE System I brokerage or Mead Lexis legal system terminals.

- Terminals lacking intelligence operate with low-speed lines. Intelligent terminals, containing microcomputer programmable memory and, at times, disk storage, operate at higher speeds (1200 bps and up), and offer increasing flexibility in handling on-line data base offerings from multiple vendors.

- Vendors elected to offer special-purpose terminals at a time when general-purpose terminals lacked the intelligent hardware to provide a "user-friendly" interface. INPUT believes that vendors who continue to take the special-purpose terminal route will, over time, become noncompetitive as end users require access to multiple on-line data base sources.

  - Special-purpose terminals such as Quotation's Vuset are appropriate when market research indicates the end user needs only one type of data.

c. Minicomputers

- Minicomputers are playing an increasingly important part in on-line data base services offerings.


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- Computational capability, memory size and disk storage capacity have reached the point where minicomputers are replacing RCS mainframes in selected areas.

  - Autex, among others, uses minicomputers in its on-line data base trading system offerings.

  - BRS is using minicomputer systems for "private" on-line data base system offerings.

  - SDC, with hardware developed for Record Manager, plans to offer a family of proprietary microcomputer-controlled data base storage and retrieval systems.

- Minicomputer-controlled word processing systems are proliferating in areas of office automation. General-purpose terminals throughout a company can now access both internal and external data bases from multiple-vendor sources through the user site minicomputer.

- In future on-line data base services offerings, vendors must consider distributing data bases, possibly on a selective dissemination basis, to user site, minicomputer-controlled office automation systems.

d. System Response

- On-line data base services are essentially interactive. Ideally, the end user should experience no discernible delay in interacting with the system using the keyboard.

- Delays in executing data base accessing commands should not exceed one to two seconds on the average, and not more than five seconds at any time.

- Experienced users can tell when the system is slow in executing search commands and will shift to alternate services if available. Search times in


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excess of 10 seconds on numeric time series data bases, one to two minutes on bibliographic, and two to four minutes on textual data bases, fall into an "unacceptable" category.

- Response requirements for securities and commodities data base services, real time in nature, are outlined under Financial Inquiry Services System Requirements in INPUT's report "Remote Computing Services Markets for Economic and Financial Data Bases."

e. Data Base Characteristics

- End users find those data bases most useful that have the following characteristics:

  - Data are comprehensive in scope for the area covered.

  - Source data are analyzed and edited so that they are valid; that is, virtually error free.

  - Data are timely in terms of both data entry and length or time period covered.

- For example, a securities and commodities data base, to be useful, must:

  - Contain stock quotations on all securities traded on all exchanges covered by the service offering.

  - The data must contain the correct bid and ask price, and the price of the last sale.

  - The quotation data must be furnished in real (or near real) time. Historical prices for at least the last 12 months of trading must be available for access.


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## B. MARKETING ISSUES

### 1. PERSONNEL

- Perhaps the most limiting factor in expanding on-line data base services markets is the lack of available technical personnel knowledgeable in both end user needs and solutions using specific data base products.

- The key to selling econometric data base services, for example, is availability of qualified consulting economists with advanced degrees.

  - Sources can be either in-house staff or consultants from industry or universities.

- Economic and financial data base services are best supported by technical assistance from MBA graduates trained in specific industries or disciplines.

- Other data base services require similar technical support:

  - Lawyers for legal data bases.

  - Process engineers for properties data bases.

  - Information specialists (librarians) for bibliographic data bases.

  - Geologists for resources data bases.

- Joint marketing ventures with data base vendors, particularly where proprietary software is offered in conjunction with the data bases, can provide RCS vendors with the technical support necessary for successful marketing of on-line data base services.


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- Acquisition of specialty data base firms is often the best way to obtain qualified personnel for RCS marketing operations.

2. TRAINING

- Market growth is constrained by inadequate training programs from vendors. End users shy away from on-line data base services they find difficult to use.

- RCS vendors can expand market penetration by designing a series of training programs, given both at vendor offices and on user sites, which expand end user knowledge of how to access and use on-line data base services effectively.

3. SEMINARS

- Corporate management as well as potential end users are frequently unaware of both the types of data bases that are available and how on-line data base services can be effectively used to support their business operations.

- Besides increasing market awareness, vendors will find that potential users are willing to pay significant fees for attending well-planned and well-run on-line data base seminars.

4. MARKET POSITIONING

- Successful vendors will make every effort to differentiate their on-line data base product offerings from those of their competitors.

  - Additional value is added when licensing arrangements permit data bases to be offered on an exclusive basis.

- Offerings should stress "ease of use." The market trend is toward "friendly" on-line system interfaces that relieve the end user of the necessity to understand sophisticated computer systems jargon.


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- Vendors should target marketing efforts in specific market sectors. They should establish their presence through viable products supported by expertise in one market area, then expand product offerings to gain market penetration in that sector.

  - Once established in one market sector, vendors can expand into related market sectors.

- Marketing should look to offer on-line data base services packaged as a total system: data base, software, networking, terminals and maintenance.

- Vendors should advertise - little effort is spent here to date.

5. MARKET INTEGRATION

- There is ample evidence that vertical integration through merger, acquisition and joint venture is taking place between data base vendors, RCS vendors and distribution vendors.

- Large publishing and communications corporations are in the market for both data base vendors and RCS vendors: examples are Dun and Bradstreet's acquisition of NCSS and McGraw-Hill's acquisition of DRI.

- Many smaller data base vendors and small specialty RCS vendors are good candidates for either joint venture or acquisition by diversified RCS vendors.

  - Smaller international organizations are often good acquisition candidates, providing, at times, both data bases and needed technical expertise.


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## C. FUTURE OPPORTUNITIES

### 1. CORPORATE INFORMATION SERVICES

- By the mid-1980s, data storage and communications technology will have matured to the point of supporting wide classes of information services to corporate users.

- Forerunners of such information services are:

  - Mead Corporation's NEXIS news information system.

  - GTE's prototype Viewdata offering to corporate information centers.

  - Reuthers' international financial information network.

- Corporate on-line data base information services will integrate such functions as:

  - General national and international news.

  - Financial markets information.

  - Corporate marketing activity.

  - Corporate cash management.

  - Industrial credit.

  - Electronic mail.

  - Word processing.


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- Internal information data bases.

- Corporate travel.

- Alert on-line data base services vendors will develop acquisition and joint-venture programs to expand offerings in the evolving corporate information services marketplace.

2. CONSUMER INFORMATION SERVICES

- By the late 1980s, integrated on-line data base services vendors will be tapping what could well be a 1990 market in excess of $10 billion. Per household annual expenditures of $125/year for on-line services over those of telephone and cable TV are very conservative.

- Early prototypes of such consumer information services are:

  - The British Post Office's Prestel System.

  - OCLC's Channel 2000 experimental phone/TV network in 200 Ohio homes.

  - Knight-Ridder, Inc.'s Viewtron System in 150 Florida homes.

  - Source Telecomputing Corporation's information services offerings to the personal home computer market.

- Major vendors, including Xerox, IBM, GTE and ITT, are testing the waters in preparation for market entry.

- Vendors offering on-line data base services are advised to track developments and be prepared to respond to developing opportunities in consumer information services.


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# VI COMPETITIVE ENVIRONMENT

# VI COMPETITIVE ENVIRONMENT

## A. COMPETITIVE STRUCTURE

- Competition in the market for on-line data base services is among three vendor types:

  - Data base vendors producing and maintaining data bases for license (lease). Only license to RCS vendors is considered by this study. Data base vendors offering data bases on-line to users through private networks or through distribution vendors are considered RCS vendors.

  - Remote Computing Services vendors offering either their own data bases or licensed data bases from data base vendors, on-line to end users. Services may be delivered through private networks and/or distribution vendors.

  - Distribution vendors able to reach widely dispersed end users using value added network services (VANS). Only TYMNET and Telenet were considered in this study.

- The study identified over 200 vendors participating in the U.S. marketplace.

  - Over 140 data base vendors.

  - Over 60 RCS vendors.


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- Two distribution vendors.

- The market is widely shared. Although some vendors hold major portions of selected on-line data base market segments, no one vendor controls even 10% of the total market.

## B. MARKET SHARE

- The nearly $1.2 billion 1979 market for on-line data base services is shared among vendor types as follows:

  - $260 million, or 22%, by data base vendors.

  - $890 million, or 76%, by RCS vendors.

  - $20 million, or 2%, by distribution vendors.

- As shown in Exhibit VI-1, 18 data base vendors (just over 10% of the identified data base vendors) account for 60% of that market segment.

- Total data base subscription revenues are highest (23%) for marketing data bases. Data base vendors involved in gathering data or consumer markets can demand high royalties for on-line data base subscription and access.

- Some vendors are diversified in the type of data bases they offer. Major vendors as a group have data base subscription revenues totalling 14% of the market. Most of the information provided is in the form of historic and forecast numeric data associated with financial, industry, resources and international data bases.

- Vendors providing large volumes of real-time trading data from the major stock and commodity exchanges directly to securities and commodities on-line


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EXHIBIT VI-1

## DATA BASE SERVICES MARKET IN 1979

| VENDOR | DATA BASE OFFERINGS | 1979 REVENUE ($ MILLION) | MARKET SHARE (PERCENT) |
|---|---|---|---|
| DRI | DIVERSIFIED | $ 15 | – |
| CEAI | DIVERSIFIED | 12 | |
| WEFA | DIVERSIFIED | 5 | |
| TELSTAT | DIVERSIFIED | 6 | |
| | SUBTOTAL | $ 38 | 14% |
| DOW JONES | SECURITIES AND COMMODITIES | 10 | – |
| ASSOCIATED PRESS | SECURITIES AND COMMODITIES | 12 | |
| | SUBTOTAL | $ 22 | 8% |
| S/P COMPUSTAT SERVICE, INC. | FINANCIAL AND ECONOMIC | 2 | – |
| ARNOLD BERNHAND AND COMPANY | FINANCIAL AND ECONOMIC | 2 | |
| | SUBTOTAL | $ 4 | 2% |
| CACI, INC. | DEMOGRAPHIC | 2 | – |
| URBAN DECISIONS, INC. | DEMOGRAPHIC | 2 | |
| | SUBTOTAL | $ 4 | 2% |
| PETROLEUM INFORMATION CO. | RESOURCES | $ 2 | 1% |
| ARBITRON, INC. | MARKETING | 12 | – |
| A.C. NIELSEN | MARKETING | 40 | |
| SAMI | MARKETING | 9 | |
| | SUBTOTAL | $ 61 | 23% |
| STANDARD AND POORS | CREDIT | $ 15 | 6% |
| DATA COURRIER, INC. | BIBLIOGRAPHIC | 2 | – |
| PREDICASTS, INC. | BIBLIOGRAPHIC | 2 | |
| | SUBTOTAL | $ 4 | 2% |
| CHEMSHARE | PROPERTIES | $ 5 | 2% |
| OTHERS | DIVERSIFIED | $105 | 40% |
| TOTAL | – | $260 | 100% |


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data base services vendors, form another important data base vendor group. Two major vendors account for 8% of total data base subscription revenues.

- Most financial and economic data bases, derived from government data, are maintained and offered directly by RCS vendors. However, a number of commercial data base vendors maintain high value added financial and economic data bases. Two major vendors make up a small (2%) but important part of the total data base market.

- Some 25 vendors have nearly 70% of total revenues for the RCS segment of the market for on-line data base services, as shown in Exhibit VI-2.

- Vendors offering a wide variety of data base services across many of the 14 data base market subsegments (such as econometric, resources, industry, demographic and international) form the major group, accounting for 20% of total RCS revenues.

- Vendors offering credit data base services to both commercial and consumer markets, with 17% of total RCS data base related revenues, are the most important specialty group.

- Another important specialty area - securities and commodities data base services - offered in real time to support securities exchange trading operations, is currently dominated by three major vendors whose revenues comprise 11% of the RCS segment total.

- The largest vendor of specialty services, offering a total legal on-line data base service, including data bases, software, networking, specialized terminals and maintenance, has revenues equal to 7% of total RCS related revenues.

- Two major vendors in a potentially explosive market segment account for 3% of total RCS on-line data base revenues through offering news data bases.


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EXHIBIT VI-2

## REMOTE COMPUTING VENDORS' SHARE OF ON-LINE DATA BASE SERVICES MARKET IN 1979

| VENDOR | DATA BASE OFFERINGS | 1979 REVENUES ($ MILLION) | MARKET SHARE (PERCENT) |
|---|---|---|---|
| DRI | DIVERSIFIED | $ 26 | |
| IDC | DIVERSIFIED | 36 | |
| ADP | DIVERSIFIED | 25 | |
| NCSS | DIVERSIFIED | 16 | |
| CSC | DIVERSIFIED | 5 | – |
| GEISCO | DIVERSIFIED | 36 | |
| SBC | DIVERSIFIED | 24 | |
| RAPIDATA | DIVERSIFIED | 12 | |
| | SUBTOTAL | $180 | 20% |
| QUOTRON | SECURITIES AND COMMODITIES | 40 | |
| GTE/IS | SECURITIES AND COMMODITIES | 20 | – |
| BUNKER RAMO | SECURITIES AND COMMODITIES | 35 | |
| | SUBTOTAL | $ 95 | 11% |
| MEAD DATA CENTRAL | LEGAL | 65 | 7% |
| N.Y. TIMES INFORMATION BANK | NEWS | 20 | – |
| DOW JONES, INC. | NEWS | 8 | |
| | SUBTOTAL | $ 28 | 3% |
| INTERACTIVE MARKETS, INC. | MARKETING | 5 | – |
| TELMAR MEDIA SYSTEMS | MARKETING | 5 | |
| | SUBTOTAL | $ 10 | 1% |
| TRW INFORMATION SERVICES | CREDIT | 40 | |
| TRANS UNION CORP. | CREDIT | 28 | |
| EQUIFAX | CREDIT | 25 | – |
| TELECREDIT | CREDIT | 30 | |
| TELECHECK | CREDIT | 16 | |
| NATIONAL DATA CORP. | CREDIT | 12 | |
| | SUBTOTAL | $151 | 17% |
| OCLC | BIBLIOGRAPHIC | 25 | |
| LIS DIALOG | BIBLIOGRAPHIC | 12 | – |
| SDC SEARCH | BIBLIOGRAPHIC | 6 | |
| BRS | BIBLIOGRAPHIC | 3 | |
| | SUBTOTAL | $ 46 | 5% |
| PRC REALTY SYSTEMS | REAL ESTATE | $ 25 | 3% |
| OTHERS | DIVERSIFIED | $290 | 33% |
| TOTAL | | $890 | 100% |


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- Over half of the RCS revenues for bibliographic on-line data base services (5% of total revenues shared by four vendors) go to OCLC, a non-profit venture.

  - Revenues for bibliographic data base services supplied by the federal government are not included in this study.

## C. TYPICAL VENDORS AND PRODUCTS

- Key data bases and vendor services for each data base market subsector are presented in Chapter IV, Market Analysis by Data Base Subsector.

- The information presented below illustrates the products and offerings of key vendors from an integrated viewpoint across data base market subsectors.

### 1. DATA RESOURCES, INC.

- Data Resources, Inc. (DRI) offers the most extensive set of econometric data base services to Fortune 500/50 companies.

- More recently DRI has been targeting economic and financial on-line data base services to corporate planning and marketing departments of Fortune 1000/100 companies.

- Over 25 data bases in six data base subsectors, including resources, industry and international, are compiled and maintained primarily by DRI.

  - Data bases obtained by license from data base vendors include:

    . COMPUSTAT.

    . Platts Oil Data Bank.


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- Best Executive Data.

- Financial and Credit Statistics.

- DRI has been successful in bundling most of its offerings in a package that includes printed reports, consultation, seminars, data base access and models for an annual subscription fee approaching $40,000.

- With its acquisition by McGraw-Hill, DRI can be expected to expand on-line data base offerings into markets currently served by McGraw-Hill publications.

- DRI serves over 600 clients with 1979 revenues of approximately $40 million, over half of which came from RCS services.

2. INTERACTIVE DATA CORPORATION

- Interactive Data Corporation (IDC), the data utility for Chase Manhattan Bank, offers over 40 data bases in six data base market subsectors.

  - Econometric (8).

  - Financial and economic (13).

  - Industry (10).

  - Demographic (1).

  - Resources (1).

  - International (10).

- IDC licenses a number of data bases from specialized data base vendors such as:


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- COMPUSTAT.
- Wards AutoInfoBank.
- Conference Board.
- Metals Week.
- National Association of Home Builders (NAHB).
- Payment Systems.
- Value Line.

- Econometric and financial and economic on-line data base services are offered using 20 data bases supplied by CEAI.

- By accessing all data bases through XSIM, IDC offers users a standard methodology for using on-line data base services.

- IDC 1979 revenues of nearly $40 million were primarily related to the use of on-line data bases.

3. AUTOMATIC DATA PROCESSING

- Automatic Data Processing (ADP), although targeting on-line data base services to financial and corporate planning offices, offers diversified data base services in six data base market subsectors.

- ADP obtains data bases primarily through licensing arrangements with data base vendors. Over 25 data bases are offered.
  - Many of the data bases are offered with proprietary software oriented toward solving a class of end user problems.


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- BANCOMPARE from Cates Lyons & Co.
- COMPUBOND from Blyth Eastman Dillon.
- Foreign Exchange from ContiCurrency.

- On-line econometric data base services are offered through a joint venture with Townsend-Greenspan.
- Financial and economic data bases, formerly available through Chase Econometric Associates, Inc., are being replaced by those under development by Money Market Services, Inc.
- 1979 RCS revenues related to on-line data bases approached $25 million, growing at an annual rate exceeding 20%.

4. NATIONAL CSS, INC.

- National CSS, Inc. (NCSS), highly diversified, offers seven on-line data bases in six data base subsectors.
- NCSS offers demographic and economic and financial data bases for use with the modeling language EMS for corporate financial management and planning.
- Econometric on-line data base services are offered through Merrill Lynch Economics.
- In a joint venture with SRI, NCSS offers a data base together with forecasts to 1985 on world petrochemicals.
- Offerings in other data base subsectors include:
  - Legislex, legal data base on pending state legislative bills.


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- SMRB, marketing data base from Simmon Market Research Bureau, Inc.

- 1979 RCS revenues related to on-line data base services exceeded $15 million.

5. COMPUTER SCIENCES CORPORATION

- Computer Sciences Corporation (CSC), which is expanding its on-line data base services, offers ten data bases in four data base subsectors.

- CSC currently is targeting its offerings in two data base subsectors.

  - Resources data bases, with its Search and National Coal Resources data systems.

  - International data bases, with OECD and its subsidiary EML/DIADEM.

- In a joint venture with Arthur D. Little, CSC is offering SIM COST II, forecasting manufacturing costs for electronics, electrical and light mechanical industries in 14 countries.

- CSC revenues for on-line data base services, $5 million in 1979, are growing in excess of 25% annually.

6. GEISCO

- With its international RCS network, GEISCO is a leading vendor of international on-line data base services.

- GEISCO obtains data bases primarily through licensing arrangements with data base vendors. Over 20 data bases are offered in 7 data base subsectors.

- GEISCO targets industry data bases with its FAL II analysis language to offer financial management and planning services to the discrete manufacturing industry sector.


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- Econometric on-line data base services are offered through the UCLA Business Forecasting Project.

- 1979 RCS revenues related to on-line data base services exceeded $35 million.

7. SERVICE BUREAU COMPANY

- Service Bureau Company offers over 15 data bases in 5 data base subsectors.

- As part of its Business Information Services for Planning, Analysis and Control (BISPAC), SBC uses Prophit II to offer financial and economic on-line data base services to financial institutions and corporate financial officers.

- SBC has been successful in licensing data bases coupled with proprietary software.

  - VALPORT from Frederick C. Towers & Co.

  - BANKANAL from Robinson-Humphrey Co.

  - ORR from William R. Orr Cost Systems Engineers, Inc.

- Econometric on-line data base services are offered through a new joint venture with Evans Economics.

- 1979 revenues related to on-line data base services exceeded $20 million.

8. RAPIDATA

- Rapidata specializes in on-line data base services to financial institutions and corporate financial officers.

- Seven economic and financial and international data bases are offered.


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- Using its proprietary modeling languages PROBE and FISCAL, Rapidata assists clients in developing applications using its on-line data base offerings.

- Rapidata packages its data base offerings with specialized access software, allowing users easy access.

  - BONDS, using Telstat municipal bond data base.

  - RAPIDQUOTE, using Telstat securities data base.

- 1979 RCS revenues related to on-line data base services, 60% of total revenues, were $12 million.

9. QUOTRON SYSTEMS

- Quotron Systems, the leading vendor of securities and commodities on-line data base services, has over 30,000 terminals installed in brokerage houses, institutional investment firms, banks and other financial institutions.

- Quotron offers a total service: data base, RCS, networking, branch microprocessors, special-purpose terminals and maintenance.

- Adding capability to branch microcomputers, Quotron has been able to offer additional services such as access to in-house data on client accounts and to exchange trading floors for order execution.

- With "View Set", Quotron is offering on-line data base services to individual investors.

- With 1979 revenues exceeding $40 million and growing in excess of 20% annually, Quotron is offering quotation services to over 1,600 companies and 500 individual investors.


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## 10. MEAD DATA CENTRAL

- Mead Data Central offers both legal/accounting and, more recently, news on-line data base services.

- Mead uses a total systems approach: full-text data base, software, RCS, networking, special-purpose terminals and maintenance.

- Mead has thus far elected to use special-purpose terminals to provide more "user friendly" access to its data base offerings.

  - Both free-standing and desktop CRT terminals have special-function keys to aid access, scan and display functions.

- Lexis (legal) and Nexis (news) use full-text data bases which can be accessed by either key word or full-text scan techniques.

- Additional data base offerings include:

  - Disclosure, containing SEC corporate Form 10-K information.

  - Auto-Cite, containing citations for cross referencing case law.

  - NAARS, containing corporate accounting and accounting policy information.

- Mead's latest offering is Nexis, containing full-text data bases of key newspapers, magazines and wire services, and is targeted toward the corporate marketplace.

- With 1979 revenues exceeding $65 million, Mead currently has over 3,000 terminals on-line.


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11. DOW JONES, INC.

- Dow Jones supplies both data base services to RCS vendors offering securities and commodities on-line data base services, and RCS services to companies and individuals.

- Dow Jones/News Retrieval services, long available through quotation services such as GTE/IS and Bunker Ramo, were introduced three years ago as on-line information services to companies, using TYMNET.

- The News/Retrieval Service contains articles from the Wall Street Journal, Barrons and Dow Jones News Service. Stories on some 6,000 companies, stored for 45 days, are rapidly retrievable. Additional services include:

  - The Stock Quote Register, containing composite prices (today's and yesterday's) for 6,000 companies, is accessible by stock symbol.

  - The Historical Stock Quote Reporter, containing quarterly stock summaries since 1978, plus summaries for the most recent 24 days.

- With 1979 revenues of $18 million from over 1,000 customers, and an annual growth rate in excess of 30%, Dow Jones is also looking at offering financial information to the consumer marketplace.

12. INTERACTIVE MARKET SYSTEMS

- As one of the major specialty RCS vendors offering proprietary on-line data base services for marketing functions, Interactive Market Systems (IMS) concentrates its offerings in the New York area.

- Services are offered primarily to advertising agencies, radio and television media research departments and corporate marketing departments.


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- Through a variety of licensing arrangements, IMS offers over 15 data bases together with its own proprietary software. Typical data bases are:

  - Arbitron Radio and TV.
  - Nielsen Retail Index.
  - Nielsen Television Index.
  - Selling Areas Marketing, Inc. (SAMI).
  - Simmons Market Research Bureau.

- IMS uses TYMNET and Telenet to reach users outside the greater New York area.

- With 1979 revenues in excess of $5 million and reported growth in excess of 25% annually, IMS serves over 450 clients.

## 13. TELMAR MEDIA SYSTEMS

- Telmar Media Systems (TMS) specializes in on-line data base services for marketing operations.

- Combining proprietary software with some 13 data bases licensed from data base vendors, TMS offers services to both buyers and sellers of media advertising. Typical data bases are:

  - Target Group Index.
  - Magazine Research, Inc. (MRI).
  - Arbitron Radio and TV.


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- Nielsen Station Index.

- Using block time and networking from RCS vendors, TMS markets its services nationwide.

- TMS is developing regional data bases for selected consumer markets and is planning to use micro/minicomputers in some product offerings.

- With 1979 revenues exceeding $5 million and an annual growth rate in excess of 25%, TMS serves nearly 500 users.

14. TRW INFORMATION SERVICES

- TRW Information Services specializes in credit on-line data base services.

- Two types of credit services are offered:

  - TRW credit data on consumer credit.
  - TRW business credit services on commercial credit.

- Working with the National Association of Credit Managers, TRW offers National Credit Information Services (NACIS) to over 2,500 users.

- TRW has added key financial and business background information from Standard and Poors on 6,000 public companies, including in-depth analysis on the 3,500 largest corporations, to its business credit information data base. Key business information is included on an additional 30,000 companies.

- The TRW consumer credit data base contains credit data on approximately 80% of all U.S. households.


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- Besides supplying consumer credit services to 21 of its own credit bureaus, TRW supplies on-line credit services to another 45 independent credit businesses.

- Total 1979 related revenues of $40 million are divided between:

  - $10 million in business credit, growing at 20% AAGR.

  - $30 million in consumer credit, growing at 15% AAGR.

15. A.C. NIELSEN, INC.

- A.C. Nielsen offers subscriptions to its marketing data bases only to companies subscribing to A.C. Nielsen market research or media research services. Data base fees are determined by a subscription surcharge of up to $10,000 annually, paid directly to A.C. Nielsen.

- Three data bases are currently offered:

  - Nielsen Retail Index.

  - Nielsen Station Index.

  - Nielsen Television Index.

- A.C. Nielsen, through acquisition, is integrating its marketing data bases with RCS services.

  - Coordinated Management Systems (CMS) offers retail data base services.

  - Media Research Operations Center offers media data base services.


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- Total revenues of $60 million for on-line data base services in 1979, growing at a rate exceeding 30% annually, are derived from:

  - $40 million in data base subscriptions.

  - $20 million in RCS revenues.


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# APPENDIX A: DATA BASE

EXHIBIT A-1

FORECAST OF USER EXPENDITURES FOR
ON-LINE DATA BASE SERVICES BY VENDOR TYPE,
1979-1985

| VENDOR TYPE | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 PERCENT |
| DATA BASE VENDORS | $ 260 | $ 320 | $1,020 | 26% |
| REMOTE COMPUTING SERVICES VENDORS | 890 | 1,090 | 3,180 | 24 |
| DISTRIBUTION VENDORS | 20 | 30 | 80 | 26 |
| TOTAL | $1,170 | $1,440 | $4,280 | 24% |


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EXHIBIT A-2

FORECAST OF USER EXPENDITURES FOR ON-LINE DATA BASE SERVICES BY INDUSTRY SECTOR, 1979-1985

| INDUSTRY SECTOR | USER EXPENDITURES | | | |
|---|---|---|---|---|
| | 1979 $M | 1980 $M | 1985 $M | AAGR 1985/1979 PERCENT |
| BANKING AND FINANCE | $ 273 | $ 330 | $ 873 | 22% |
| MANUFACTURING | 205 | 262 | 899 | 28 |
| SERVICES | 187 | 233 | 807 | 27 |
| RETAIL | 131 | 159 | 497 | 25 |
| TRANSPORTATION | 46 | 60 | 214 | 27 |
| GOVERNMENT | 52 | 61 | 142 | 19 |
| INSURANCE | 44 | 52 | 112 | 17 |
| EDUCATION | 33 | 42 | 111 | 22 |
| WHOLESALE | 31 | 38 | 115 | 24 |
| UTILITIES | 5 | 7 | 21 | 27 |
| MEDICAL | 1 | 1 | 4 | 26 |
| OTHER | 162 | 195 | 485 | 20 |
| TOTAL | $1,170 | $1,440 | $4,280 | 24% |


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EXHIBIT A-3

FORECAST OF USER EXPENDITURES FOR ON-LINE DATA BASE SERVICES BY DATA BASE SUBSECTOR, 1979-1985

| TYPE | 1979 ($M) | 1980 ($M) | 1985 ($M) | AAGR 1985/1979 (PERCENT) |
|---|---|---|---|---|
| ECONOMETRIC | $ 67 | $ 80 | $ 200 | 20% |
| SECURITIES AND COMMODITIES | 140 | 155 | 300 | 14 |
| FINANCIAL AND ECONOMIC | 125 | 160 | 450 | 24 |
| DEMOGRAPHIC | 36 | 43 | 135 | 25 |
| RESOURCES | 16 | 22 | 96 | 35 |
| INDUSTRY | 37 | 46 | 126 | 23 |
| LEGAL/ACCOUNTING | 75 | 97 | 360 | 30 |
| NEWS | 40 | 53 | 235 | 34 |
| MARKETING | 105 | 135 | 510 | 30 |
| CREDIT | 240 | 286 | 710 | 20 |
| BIBLIOGRAPHIC | 62 | 80 | 255 | 26 |
| PROPERTIES | 22 | 28 | 95 | 27 |
| REAL ESTATE | 45 | 54 | 175 | 25 |
| INTERNATIONAL | 18 | 22 | 68 | 25 |
| OTHER | 140 | 175 | 560 | 26 |
| TOTAL | $1,170* | $1,440* | $4,280* | 24% |

*ROUNDED


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# APPENDIX B: DEFINITIONS

## APPENDIX B: DEFINITIONS

### COMPUTER SERVICES

- These are services provided by vendors which perform data processing functions using vendor computers (processing services) or assist users to perform such functions on their own computers (software products and/or professional services).

- The following are definitions of the modes of service used in this report:

  - Remote Computing Services. Provision of data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. The three submodes of RCS are:

    . Interactive (timesharing), characterized by interaction of the user with the system, primarily for problem solving timesharing but also for data entry and transaction processing. The user is on-line to the program/files.

    . Remote Batch, where the user hands over control of a job to the vendor's computer which schedules job execution according to priorities and resource requirements.


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. Data Base Inquiry characterized by the retrieval of information from a vendor maintained data base. This may be owned by the vendor or a third party.

. User Site Hardware Services (USHS) offerings, typically provided by RCS vendors, which place programmable hardware on the user site (as compared to the EDP center). USHS offers:

  - Access to a communications network.

  - Access through the network to the RCS vendor's larger computers.

  - Significant software as part of the services.

- Batch Services. This includes data processing performed at vendors' sites of user programs and/or data which are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and COM processing, are also included. Batch services include those expenditures by users who take their data to a vendor site which has a terminal connected to a remote computer used for the actual processing.

- Facilities Management (FM). (Also referred to as "Resource Management" or "Systems Management.") The management of all or part of a user's data processing functions under a long-term contract (not less than one year). To qualify as FM, the contractor must directly plan and control as well as operate the facility provided to the user on-site through communications lines or mixed mode. Simply providing resources, even though under a long-term contract, and/or providing for all of a users' processing needs, does not necessarily qualify as FM.


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- Turnkey System. A combination of hardware and software integrated into a total system designed to fulfill completely the processing requirements of an application (or applications) for a user.

## PROCESSING SERVICES

- Processing services encompass facilities management, remote computing services and batch services. They are categorized by type of services bought by users as follows:

  - General Business services are processing services for applications which are common to users across industry categories. Software is provided by the vendor; this can be a complete package, a payroll package or an applications "tool," such as a budgeting model, where a user provides much of the customizing of the finished product it uses. General business processing is often repetitive and transaction-oriented.

  - Scientific and Engineering services are the processing of scientific and engineering problems for users across industries. The problems usually involve the solution of mathematical equations. Processing is generally problem solving and is non-repetitive, except in the sense that the same packages or "tools" are used to address different, but similar, problems.

  - Industry Specialty services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications "tool" which the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation; data base services, where the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included in this category. Examples of industry specialty applications are: seismic data processing, numerically-controlled machine tool software development, and demand deposit accounting.


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- Utility services are those where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines and other systems software.

## PROFESSIONAL SERVICES

- This category is made up of services related to EDP, including system design, custom/contract programming, consulting, education and training. Services are provided on the basis of:

  - Time and Materials - The billing rate is measured in units of time, rather than actual costs.

  - Fixed Price - A firm price is agreed upon for a defined piece of work.

  - Cost Plus Fee - the billing rate depends on actual costs plus a fixed fee.

## SOFTWARE PRODUCTS

- This category includes user's purchase of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the user's site(s). Fees for work performed by organizations other than the package vendor are counted in professional services. There are several subcategories of software products.


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- Application Products are software which perform processing to serve user functions. They consist of:

  . Cross-industry products, used in multiple-user industry sectors. Examples are payroll, inventory control and financial planning.

  . Industry specialized products, used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.

- System Products are software that enable the computer/communications system to perform basic functions. They consist of:

  . System operations products, which function during applications program execution to manage the computer system resource. Examples include operating systems, DBMS, communication monitors, emulators and spoolers.

  . System utilization products, used by operations personnel to utilize the computer system more effectively. Examples include performance measurement, job accounting, computer operations scheduling and utilities.

  . System implementation products, used to prepare applications for execution by assisting in designing, programming, testing and related functions. Examples include languages, sorts, productivity aids, data dictionaries, report writers, project control systems, program library management systems and retrieval systems.

- All expenditures and revenues addressed are "available" in that they are open for competition. "Captive" figures, which refer to expenditures by a user for services from a subsidiary company, such as Boeing Aircraft with Boeing


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Computer Services (BCS), are not included. They may be referred to when examining an individual "spin-off" vendor, such as BCS.

- When any questions arise as to the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint and categorizes the expenditures according to the answer to the question, "What does the user perceive it is buying?"

## DATA BASE

- An organized collection of information. The data base may contain a collection of time series of numeric data, a collection of indexed or full-text textual data, or a combination of both. Data bases contain principally historic information but they may also contain real (or near real) time data and, in special circumstances, forecasted data. Data bases may be in either printed form or, increasingly, automated in machine processable form.

## ON-LINE DATA BASE

- Data bases that are available for interactive access by users through RCS and distribution vendor networks where access is by computer terminals (alternatively microprocessors, minicomputers or mini-controlled word processing systems).

## DATA BASE VENDOR

- Data bases are produced and maintained by vendors who frequently produce the data base as a by-product of electronic publishing. In addition to offering


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the data in the form of printed publications, the vendor offers the computer-readable data base either directly (often on-line) or, more frequently, through remote computing services (RCS) vendors. Data base vendors charge subscription fees or collect royalties or both, for using data bases on-line. Charges may be either direct to the end user or through licensing arrangements with RCS vendors.

## REMOTE COMPUTING SERVICE (RCS) VENDOR

- See definitions of Computer Services. RCS vendors offer data bases that they build and maintain themselves or license from data base vendors, or both. Data base vendors who offer data bases on-line to end users either through their private networks or via distribution vendors are considered RCS vendors in this report.


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# APPENDIX C: RELATED INPUT REPORTS

APPENDIX C

## RELATED INPUT REPORTS

| NAME | REPORT NUMBER | DATE |
|---|---|---|
| REMOTE COMPUTING SERVICES MARKETS FOR ECONOMIC AND FINANCIAL DATA BASES | MAS INDUSTRY REPORT NUMBER 5 | JANUARY 1977 |
| FINANCIAL MANAGEMENT AND PLANNING SERVICES AND SOFTWARE MARKETS | MAS INDUSTRY REPORT NUMBER 18 | FEBRUARY 1979 |
| MARKET ANALYSIS SERVICE 1979 ANNUAL REPORT | MAS REPORT | DECEMBER 1979 |
| IMAGE PROCESSING SYSTEMS-CONCEPTS AND STATUS | USER VENDOR WATCH | APRIL 1980 |


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# APPENDIX D: MARKET OPPORTUNITIES FOR DATA BASE SERVICES: INTERVIEW PROGRAM

APPENDIX D

# MARKET OPPORTUNITIES FOR DATA BASE SERVICES: INTERVIEW PROGRAM

| VENDOR TYPE | NUMBER INTERVIEWED |
|---|---|
| DATA BASE VENDORS | 18 |
| REMOTE COMPUTING VENDORS | 32 |
| DISTRIBUTION VENDORS | - |
| TOTAL | 50 |


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# APPENDIX E: QUESTIONNAIRE

# VENDOR QUESTIONNAIRE

## INFORMATION DATA BASE SERVICES

1. Discuss the types of products/services you offer.

Services: _____

_____

_____

_____

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Data Bases: _____

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_____



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2. What markets do you serve?

3. How large in terms of revenues do you think each of the markets you serve are?

4. How fast are these markets growing?



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5. What are your best estimates of the revenues you derive from the markets you serve?

6. What portion of total revenues is derived from:

| | |
|---|---|
| Data Base Subscriptions | _____ % |
| Data Base Related Access and Computation | _____ % |
| Professional Services | _____ % |
| Communications | _____ % |
| Other _____ | _____ % |
| | 100 % |

7. What about your growth as compared to the entire market?



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8. What is your best estimate of the share of each of the markets you serve?

9. Who are your major (3-4) competitors, and how do they rank in each of the markets you serve?

10. Who are buyers/users of the services/products you offer?

Buyers:

Users:



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11. What types of hardware do you offer in conjunction with your service?

☐ None

☐ Terminals

☐ Mini/Microcomputers

12. To what extent is technology impacting your markets or delivery system?

13. What types of software aids are necessary to use as part of the service/product you offer?


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14. Which, if any, of your products/services are offered as turnkey systems?

☐ None

15. How are data bases offered created or updated?

16. How many users do you serve with each of your product offerings? What are the major industries served?


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17. What new market areas do you see for your data base related products/ services? Any newly announced products?

18. What major changes do you see taking place in the information data base marketplace in the 1980s?

19. Available literature being sent?

☐ Yes ☐ No


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